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An Apple Special Publication

AUGUST 1985

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COMMODORE

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MESSAGE.....

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Modems—Close encounters with your 64

S-t-t-t-t-r-r-r-r-etch! BASIC on the rack

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fab competition
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PAUL McCARTNEY



JUMP JET

CBM 64
CASSETTE £9.95
DISK £11.95



Written by
Vaughan Dowd
Jump Jet Pilot

Every pilot has the dream of flying one of these unique and complex fighting machines. Here is your chance to do what few pilots have the privilege to try.

Depending on your skill, confidence and courage, you have the choice of remaining near the landing pad, learning to hover and land, or venturing higher to practise your approaches. When you think you have mastered these, then allocate the Jump Jet into an attack fighter. Use the radar and range finder to seek and destroy the enemy, by launching heat-seeking air-to-air missiles. Beware! His radar and missile systems are as good as yours. Backless pursuit is ill-advised; you must maintain a fast level that will enable you to relocate and return to the aircraft carrier, executing the skills you have learned to achieve a successful landing.

You are now ready to proceed to the next skill level to face additional hazards, such as unpredictable wind and treacherous cross-winds.

Be warned, this program is not a toy or game. You will need to co-ordinate your hands, eyes and mind to successfully complete each mission. Do not hope to achieve in a short time that which took the author three years to learn as a Jump Jet pilot, and over a year to record on this computer program.



ANIROG

Our COMMENT

IT'S NINE O'CLOCK IN THE MORNING. Our famous hero Adrenoid Anthony is rising from bed for a day at school.

Anthony descends the stairs and walks over to his Commodore C900, switches it on and sticks up his local education centre ready for the day's lessons.

You may think that all of this seems a little far-fetched. Well it isn't. It is already possible for you to link your computer to numerous other systems around the country by means of a device called a modem. Quite simply a modem takes information from one computer, translates it into a form which can be sent down a telephone line and a modem at the other end of the call translates this back into a form that the other computer can understand.

The "other computer" could be one that is somebody's friend and you could be sending your latest programs to one another or it could possibly be one of the large commercial systems such as Prestel or Compuserve. Prestel is used within many companies for gathering information. You must have seen Prestel terminals in travel agents used for keeping their up to date with variable holidays. Compuserve is a system run specifically for Commodore owners and offers news, games and an area called the Jungle where subscribers to the system can set up their own area and store their own programs.

So you see, Adrenoid's "school in the home computer" is not really all that far away, you can already get access to a large amount of information over your telephone line.

In order to help you to enter this new area of computing we have a couple of features in this issue dedicated to communications on your Commodore computer.

The first article explains just what is available once you have linked out the money for a modem for your computer. There is even a list of bulletin board telephone numbers that will allow you to access computers all over Great Britain.

The second article gives details about some of the modems that are currently available for Commodore micros and explains the differences between the

cheaper and cheaper modems.

Why not join Adrenoid Anthony by becoming a part of this exciting new area!

Introductions

Now it's time for the boring bit where I get a chance to introduce myself.

You may have noticed that there has been a few changes to the list of staff working on the magazine. Alison Hjal has unfortunately moved on to new pastures and I have taken over as Editor of the magazine.

Even though I am sat here at Your

Commodore HQ, I feel that this is not my magazine but rather, as it stated in the title, it is yours, the readers. In order for me to continue seeing the magazine in this way I must rely on all you Commodore owners sat at home, programming your machines and making new discoveries, to write to me here at Your Commodore, sending in that fantastic idea game that you think everyone will love to play or that great new utility that will turn your computer into the best thing since the creation of Commodore Business Machines.

So there you have it, get stuck into the magazine, have fun and don't forget I'm waiting to hear from you.





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Editor: Stuart Cooke
Group Editor: Mandy Palmer
Software Reviews: John
Dobson
Advertisement Manager: Mike
Teggin
Advertisement Copy Control:
Lynn Chapman
Publishing Director: Peter
Webb
Chairman: Ian Connell
Organisation: Steve Topping
Design: MM Design

Editorial & Advertisement Office:
No. 1 Golden Square,
London W1R 3AR
Telephone: 01-477 0626
Telex: 587106

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Our own series that will turn your computer
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to anyone with a modem. Complete with a list of
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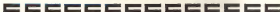
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Just what is top of the pops this month!



E- DATA STATEMENTS

Public see the 128

The broad public had its first glimpse of Commodore latest computer at the South International Commodore Computer Show. The Commodore 128 was on show together with a full range of new peripherals, including a new disk drive, the 1571 which will load programs much faster than the existing 1540. The 1571 is seen as a replacement for the 1540 as it is completely compatible with the Commodore 64, although the disk drive will not work any faster than the present 1541 on this machine.

No prices were announced for the new hardware and it was also stated that there will be no price cut made to the Commodore 64. In order to promote the '84 Commodore has announced a number of value added packs. The first of these is a 164 cassette recorder and a copy of International Soccer for £199. Sales of the new Commodore package will be further promoted by a special holiday offer that will give anyone purchasing a Commodore 64 or Commodore '84 three night's free accommodation for two people at a choice of 300 hotels throughout Britain and the Continent.

As well as promoting the sales of the '84, special peripheral value packs were announced, for £129 it will be possible to

purchase a 1541 disk drive with the Commodore Modem and a selection of disc based software. This is a saving of over £200.

A business pack is being offered, based around a Plus/4, for £449. This pack comprises of a Plus/4, a 1541 disc drive and an MPS 800 dot matrix printer. A suite of business programs, called Image 1.1.1, is also included in the price. This pack has an overall saving of £160.

Probably the most exciting item to be presented at the show there was a sound sampling device from Music Sales, the company who produce the Commodore music keyboard. The device will allow you to sample any sound, for example a human voice, and then after it using the computer. You could alter the pitch of the speech so that it was either higher or lower than your own, you could even play a tune on the word hello if you really wanted. The sampler is expected to be ready for launching Christmas and will cost around £70.

Hoffman House launched a number of new titles at the show. Hoffmann House showed Exploding Fox based around the latest games that are in the arcade. Domark showed A View To A Kill, based around the James Bond film of the same name. And Island Logic were showing their Music System a program which mimics much publicity on the BBC.

Fly to the USA



IT IS THE NORMAN AMERICAN SOFTWARE to be bought by British companies and launched in this country, one only has to look at the giant US Cold-to-power that this works.

It is, however extremely unusual to hear of a British software product to be bought by an American company for sale in the States. However, this is just what has happened to Digital Integration and its game fighter Hawk.

Digital Integration has licensed a deal with the US game IFFA that will allow IFFA to manufacture and market the software on the game throughout the US and Canada. The name of the program will be changed to Jet Flight Simulation.



Gibbo Jams for Virgin



JOYNT 'YIBBO' GIBBO IS THE AUTHOR of the Taitan games Jammin', Boss's Night Out and the new special has-quint the Burlington based company and licensed his latest game to Virgin.

The new game, Ghemobleser was produced by Gibbo and his partner Mark Harrison. Both of them are very big music fans, as reflected in earlier games, and have produced what can only be described as a Musical Arcade Adventure. In fact there is so much music in the game that a special synthesizer was designed for them to work on.

In the game you play the part of 'Rockin' Roadway, first seen on a flashing spot vanishing in the game Jammin', as a messenger for Inventive Records. Roadway must run around funky town collecting demo tapes which are for possible release. For some unknown reason Roadway also has the task of making the locals dance.

The game contains 12 original pieces of music, and the graphics are extremely reminiscent of Golden Taitan games.



What Next?

Q. When is a game not a game?

A. When it's called *Rocky Runner* the latest program from the Activision stable.

Rocky Runner is described as a musical fantasy of light, colour and sound. The aim of the game is to traverse a web pattern and freeze a number of objects that are moving around it. The difficulty in deciding whether or not it is a game stems from the fact that there are no lives and no points scored. Whatever *Rocky Runner* Computer game without a computer!

Rocky Runner should be available in your local computer store and will cost £18.95.

U.S. Gold go to Disneyland

U.S. Gold, Greco and Walt Disney Productions have finalised a deal that will give the British company a license to create computer programs for the forthcoming Walt Disney films *Return to Oz*, the sequel to the *Mizard of Oz*, and *The Black Cauldron*, a film which Disney are expected to spend around £160,000 on the advertising alone. As well as producing games for the new films, U.S. Gold and Greco have been commissioned to produce a game based around that old favourite the *Jungle Book*.

It would also appear that U.S. Gold is being allowed to use many of the other popular characters from Disney films including *Mickey Mouse*, *Donald Duck*, and *Minnie the Mouse*.

In addition to the agreement that will allow U.S. Gold to use those *World Famous* characters, U.S. Gold will also have the rights to the current range of *Walt Disney* titles. The first three to be released are:

'Mickey's Space Adventure' which is described as an adventure game through

our solar system for ages of 8 years upwards. *'Minnie the Mouse in the Hundred Acre Wood'* another adventure for children aged 7 years and up and *'Donald Duck's Playground'* which aims to teach the skills of matching items, making money and change making.

These products are marketed in the U.S. by Greco On-Line and U.S. Gold hope to have them available on the market by Christmas 1985.

A Timeslip for English Software

ENGLISH SOFTWARE, A COMPANY THAT became established by producing software for the old Atari computers, has just launched its first game for the Commodore-C64/Plus-4. The game, called Timeslip, features what English software claims unique game design, whatever that may be and, if you split screen scrolling action for one player.

Each of the split-screen sections is 15 screens wide, all of them different, and all fitting into just 16K. Timeslip will cost \$5.95.



Summer Madness

You can definitely tell that it is summer just by looking at the latest games available from Activision. All three of them are computer simulations of sports.

On-court tennis will keep all you tennisists busy happy. You can choose from four players, all supposedly patterned from real life tennis players, and the type of court that you wish to play on. It just hope we don't have any display of foul behavior from the stars.

Major league baseball brings the excitement of this American game into your living room. Options to play against another human player or the very tough computer player should keep all the family happy.

Kids of the American version of football are carried on with Gridfield football. This game allows you to play this extremely violent sport within the safety of your own home.

ON-COURT TENNIS



MAJOR LEAGUE BASEBALL



Superman visits Great Britain

MASCOTTE-FILMS INC. SOFTWARE WILL be launching a new adventure game based around that well loved superhero Superman.

The adventure game is being produced in close association with America's First Star who are part of the Warner Communications Group.

What Mascotte's Timeless software claims to be a unique concept called 'authoring' has been used in writing the game. This system allows the game and graphics designers to create superbly animated cartoon graphics.

Mascotte is due to launch their debut title.

Mascotte's first title should just be appearing on the market these are the Man of Steel and Quake Menus One.

HOME RUN!





COMMODORE 64



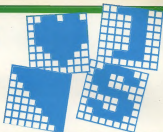
"STAFF OF KARNATH" and "ULTIMATE" recommended
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(P&P are included) Tel: 0530 411485

Listings will be much easier to enter with our new system.

COMMODORE LISTINGS ARE RATHER well known for the horrible little black blocks that always abound. Unfortunately the graphics characters which are used to represent graphic and control characters do not reproduce very well and they are also difficult to find on the Commodore keyboard.

For this reason Your Commodore started to precede any control characters with a REM statement on the previous line that explained exactly what the black blocks were meant to be. Unfortunately the graphics characters were not documented and these still cause some confusion. For this reason we are starting to use a new method for marking the control and graphic characters in our listings.

In future all control and graphics statements will be replaced by mnemonic within square brackets. This mnemonic is not typed out as printed in the magazine but rather the corresponding key or keys on the keyboard are pressed. For example [RIGHT] means press the cursor right key, you do not type in [RIGHT]. All of the keywords, what keys to press and how they are shown on the screen are shown below.



LISTINGS

Any character that is accessed by pressing shift and letter will be printed as [x LETTER]

[x A]
[x C]

shift and A
shift and C

Any character that is accessed by pressing the Commodore key and a letter will be printed as [x LETTER]

[x A]
[x C]

Commodore & A
Commodore & C

[x C]

Commodore & I

Any control key will be printed out as a number. For example [001]. Control codes are accessed by pressing the CTRL, & A, 002 & CTRL & B etc. See the manual for more information about control codes.

[001]
[004]

CTRL & A
CTRL & B

Mnemonic	Symbol	what to press
[RIGHT]		left/right
[LEFT]		shift left/right
[UP]		Shift & up/down
[DOWN]		up/down
[F1]		F1
[F2]		shift & F1
[F3]		F3
[F4]		shift & F3

Mnemonic	Symbol	what to press
[F5]		F5
[F6]		shift & F5
[F7]		F7
[F8]		shift & F7
[CLEAR]		shift & CLR / HOME
[HOME]		CLR / HOME
[BYPASS]		CTRL & 5
[BYPASS]		CTRL & 6

Mnemonic	Symbol	what to press
[BLACK]		CTRL & 1
[WHITE]		CTRL & 2
[RED]		CTRL & 3
[CYAN]		CTRL & 4
[PURPLE]		CTRL & 5
[GREEN]		CTRL & 6
[BLUE]		CTRL & 7
[YELLOW]		CTRL & 8



Don't Buy another tape or disk...

Until you've seen the low, low prices in our Price List, How does Bay Hunter look at £5.45, or Lords of Midnight at £5.95? Well, the cheapest for Megabits at £14.95 while Bigger goes to Hollywood is a mere £5.95. Read us go on! There are another 300 products we could tell you about!

So where's the catch, we hear you say! How many tapes need I commit to buy in a year? The answer is none. Once you've joined our Club, for a subscription of £9, you need buy nothing!

But wait. There's more to the Club than

just the £9 you'll save on software. As a member you'll receive a bi-monthly (for the benefit of ignorant non-Commodore owners that means every two months) magazine, packed with in-depth reviews (including lots of screen photos), competitions to enter, game playing tips and lots, lots more!

Hurry now. If you apply for membership within four weeks we'll give you a £1 voucher towards your first purchase. So send off the coupon now and we'll send you our most recent magazine by return. And if you're not absolutely delighted we'll give you your money back!



Mr. Software

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MEMBERSHIP APPLICATION

TC 8/83

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IBM PC Monochrome Rom	£57.50
IBM PC Hercules Rom	£57.50
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stockholding in Europe. Just say.*

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In this month's project, Gary
Marshall shows how to
develop a drawing package,
complete with a Fill routine.

THERE ARE MANY TIMES when you will need to develop illustrations for use within a program. It could be a reference picture for a design package or the backdrop for your latest game. This month we will develop a program that will make this extremely easy for you.

It is possible to draw any shape by taking a number of points together with lines. A program is to be developed that uses a cursor to indicate the points that would be joined to create a shape. This allows a 'free hand' drawing to be made but, for those with no special artistic ability, it can be employed by using the cursor to 'trace' an illustration held against the screen.

By adding the capability to fill a region with colour, the program can then be used to 'paint' a picture, providing a most satisfying unity.

PROGRAMMING PROJECTS



Figure 1. The cursor movement keys

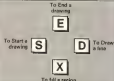


Figure 2. The keys for drawing and colouring



Figure 4. The way filling works

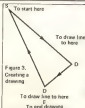


Figure 3. Creating a drawing

Standing out

Our program must begin by setting up the high-resolution graphics screen. A sprite is then created for use as the cursor, and placed on the screen. A cross-shaped cursor will give an accurate way of finding the position of a point.

When this has been done, we can drive the program with single key presses from the keyboard. One group of keys can be used to move the cursor, and another for creating and colouring drawings. The four keys positioned in a diamond around the 'V' at the right of the keyboard form a convenient group for moving the cursor, as shown in Figure 1. The four keys shown in Figure 2, which form a diamond at the left of the keyboard, will be used for drawing and filling as indicated in that figure.

The description gives our main program as:

```

Set up the high-resolution screen.
Create and position a sprite for the
cursor.
Repeat
  When a key is pressed
    If it is an "I" then move the sprite up
    If it is a "J" then move the sprite to the
    left
    If it is an "K" then move the sprite to the
    right
    If it is an "M" then move the sprite down
    If it is an "B" then start a drawing
    If it is a "D" then draw a line to the
    point
    If it is an "P" then end the drawing
    If it is an "F" then fill the region with
    colour
  End repeat

```

Writing the program

The above description converts directly to lines 10 to 120 in the program listing, giving us the main body of the program.

We have used high-resolution graphics in previous papers, and the following starting at line 500 is a setting up the mode of display is one that we have used before. We have also used sprites previously. Drawing the cross shape for the cursor (and a long the space on the screen) is done by the subroutine starting at line 2000, very similar to routines used earlier in the series. Once on the screen, the sprite (moved by lines 40 to 70, which simply increase or decrease the numbers in the register that hold its row and column numbers.

Pressing "G" to begin a drawing causes the column and row positions of the cursor to be stored in X0 and Y0, so that the start position will be available when the draw rig is to be completed. The position is then copied into X1 and Y1. To

```

5000 To set up the high-resolution graphics screen.
5005 To create the sprite for the cursor and place it in its initial position.
5010 To draw an arbitrary straight line from X0,Y0 directly vertical, horizontal, and
5015 from X00 to Y110 draw them. Line 5030 draws lines with slopes
5020 exceeding 45 degrees, and lines 5050 to 5060 draw them.
5025 To plot a point at a given row and column position. The routine is called
5030 repeatedly by the line drawing subroutines to plot a series of points
5035 along the path of the line.
5040 To fill an area from the cursor to the edge of a region.

```

Figure 1



Program Listing

```

10 GOSUB 1000: REM PREPARE HIRES SCREEN
20 GOSUB 2000: REM CREATE CURSOR SPRITE
30 GET A$: IF A$="" THEN 30
40 IF A$="I" THEN POKE 53249, PEEK(53249)
50 IF A$="J" THEN POKE 53248, PEEK(53248)
60 IF A$="K" THEN POKE 53249, PEEK(53249)
70 IF A$="M" THEN POKE 53249, PEEK(53249)
80 IF A$="B" THEN X0=PEEK(53248)-12: Y0=
90 IF A$="D" THEN X2=PEEK(53248)-12: Y2=
100 IF A$="P" THEN X2=X0: Y2=Y0: GOSUB 3
110 IF A$="F" THEN X=PEEK(53248)-12: Y=
120 GOTO 30
1000 POKE 53272, PEEK(53272) OR 8
1010 POKE 53265, PEEK(53265) OR 32
1020 FOR I=8192 TO 16191: POKE I, 0: NEX
1030 FOR I=1624 TO 2023: POKE I, 161: NEX
1040 RETURN
2000 FOR K=0 TO 60 STEP 3
2010 POKE 832+K, 0: POKE 832+K+1, 16: PO
2020 IF K=33 THEN POKE 832+K, 255: POKE
2030 NEXT K
2040 POKE 2040, 13
2050 POKE 53267, 1
2060 POKE 53267, 0

```


Program Listing (cont.)

```

2870 POKE 53240, 140: POKE 53249, 100
2900 RETURN
3000 DX=X2-X1: DY=Y2-Y1
3010 IF DX=0 THEN 3080
3020 IF ABS(DY/DX) > 1 THEN 3130
3030 FOR C=X1 TO X2 STEP SGN(DX)
3040 R=INT(Y1+(C-X1)*DY/DX)
3050 GOSUB 3500
3060 NEXT C
3070 RETURN
3080 C=X1
3090 FOR R=Y1 TO Y2 STEP SGN(DY)
3100 GOSUB 3500
3110 NEXT R
3120 RETURN
3130 FOR R=Y1 TO Y2 STEP SGN(DY)
3140 C=INT(X1+(R-Y1)*DX/DY)
3150 GOSUB 3500
3160 NEXT R
3170 RETURN
3500 RO=INT(R/8): CO=INT(C/8)
3510 L=R AND 7
3520 BIT=7 - (C AND 7)
3530 BYTE=B192 + RO*320+ CO*8+ L
3540 POKE BYTE, PEEK(BYTE) OR 2^BIT
3550 RETURN
4000 C=X: R=Y: Y=Y+1
4010 RO=INT(R/8): CO=INT(C/8)
4020 L=R AND 7
4030 BIT=7 - (C AND 7)
4040 BYTE=B192 + RO*320+ CO*8+ L
4050 IF (PEEK(BYTE) AND 2^BIT)<> 0 THEN R
  4060
4060 POKE BYTE, PEEK(BYTE) OR 2^BIT
4070 C=C+1
4080 RO=INT(R/8): CO=INT(C/8)
4090 L=R AND 7
4100 BIT=7 - (C AND 7)
4110 BYTE=B192 + RO*320+ CO*8+ L
4120 IF (PEEK(BYTE) AND 2^BIT)<> 0 THEN 4
  000
4130 POKE BYTE, PEEK(BYTE) OR 2^BIT
4140 GOTO 4070

```

get the actual screen co-ordinates we must subtract numbers from the contents of the position registers to compensate for two factors. First, the sprite position is not the same as the dot position on the high-resolution screen. Secondly, a sprite is positioned by its bottom-left corner, and we are taking positions from the top-point at the center of the sprite.

Passing "0" means the current position of the sprite is to be stored in X2 and Y2, then a subroutine is called to a line from (X1, Y1) to (X2, Y2), and then copies X2 and Y2 into X1, Y1 ready to draw the next line. The subroutine for drawing the line starts at line 3000, and again notes that we have used before, except that it has been modified to ensure that it always draws a continuous line. This will be important when we write the routine for filling a region with colour. The subroutine operates by repeatedly calling the subroutines starting at line 3000, each simply plots a point at the current position.

Passing "1" indicates the end of a drawing, and causes a line to be drawn from the last point to the last one, giving a drawing that consists of a closed contour. The sequence of key presses that is necessary to create a drawing is illustrated in Figure 1.

Now we come to the routine for filling a region with colour. Ideally, when the drawing part of our program always gives a closed contour, we should like to place the cursor inside a contour, to indicate the region to be coloured, and have the 'painting' routine do the rest. Although this can be done, it is far from simple. The subroutine presented here, which starts at line 4000, fills an area that extends to the right and down from the cursor position and stops at the edge of the region. The sort of area that it will fill depends on the shape of the contour, and on the position of the cursor relative to it. Two examples of what it does are shown in Figure 4.

This fairly rudimentary filling routine should provide a basis from which you can develop a better one. It can also be used as an own right to fill most of a region by using it repeatedly to fill gaps left by its previous applications.

The routine starts by drawing a horizontal line to the right from the cursor position to the edge of the region. This is why the line-drawing routine must produce continuous lines. If there are any gaps then our horizontal line will go straight through them. The program then moves the drawing position down by one line from the cursor position and draws another horizontal line to the edge of the region. It repeats this until the starting position for the next horizontal line lies on the edge of the region.

Figure 5 gives a summary of the subroutines used by the program and their actions.

Yours

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Abstract

Figure 1

Gemini



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Margaret Webb dons her mortar board for the start of a regular look at the

[illegible]

THE ABILITY TO READ IS ONE OF OUR most important acquisitions, and understanding how it is acquired is essential for developing better methods of teaching reading to children. This book, written by a leading expert in the field, provides a comprehensive overview of the current state of research on reading development, from the early stages of language acquisition to the complex processes of reading comprehension. It is an essential resource for anyone interested in the science of reading.

“Your Commodore let company say he is a ‘buddy’ in introducing some ‘buddy’ to meeting some ‘buddy’ in some ‘buddy’... He knows us then he is encouraged to go to meetings. So he goes there in a meeting of software as either from software houses and publishes them.”

Talking to the child about everyday issues and getting the child to talk is a necessary first step in learning to read. There are several games which will help you to expand on their spoken language. Playing games about knowing about themselves makes the children learn for themselves.

Carl Rogers, *On Becoming a Person*, 1961, pp. 111-112.

Then, the book is divided into two parts. The first part, "Living with AIDS," deals with the practical aspects of the disease. It starts with vocabulary and terminology, and works in a more and more easy way through living and caring, discrimination, leaving the house, the doctor, the school and the family. They read all of the pages and discussed and drew it.

GOOD HOUSEKEEPING
Software



Another good game of this type is *Where the Match*, in which shapes, colors and size of objects is discussed. All of the above can be done by using old age group objects but it must be arranged that they have to be able to identify the difference. Recently I found a new bag and now it is an end to itself.

It teaches both the letter and proper language usage and that is invaluable. Alphabet cards can be clustered in natural, life-like Alphabet Games (Good and Beautiful, 2006). With one key, you can use them for the young child or they can be used with older learners. Mrs. T. then shows the child how the

most commonly occurs, your doctor will look at your child's teeth to make sure they are healthy. Your doctor will also check for any signs of infection or inflammation.

One way of doing this is to use a "shock" in the labor market, such as the loss of a job, to estimate the effect of a change in the wage rate on the labor force participation rate. This method is used in the study by J. Heckman and J. Todd (1995) and in the study by J. Heckman and J. Todd (1996).

[illegible]

At the Jungles Another line of study involves monitoring the behavior of animals moving through the jungle. In a study last year, for example, researchers tracked how the animals moved and then determined whether the animals' behavior was influenced by the forest's structure.

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It is a very good idea to have a backup copy of your data, as well as a backup copy of your backup.

Learning to live for your child, at even a supporting level, means that small baby will share in your commitment.

Remember, it's the island and not the letter C, sugar, that counts.

4. A large urban area has been selected for study.

Chapel making learning fun. With a teacher involved at a pace to suit your child, to include parents, children can easily follow and be driven into a state of "flow". Once this is achieved, learning becomes a pleasure. Your child should have a conversation on what it is that motivates them to learn, discussing the joy of learning and what you as a parent can

Software Spotlight

Spooks

★★★★

Amstrad CPC

IBM PC and compatible (optional)

RELEASED AS ANOTHER IN THE LINE of 'Poker money' games, Spooks from Mastertronic was made advertisement made game with elements of 'Pac-man'. You move a little man around a rotating maze, picking up and using various objects that are lying around while avoiding the ghosts which of course bring instant death. The object of all this action is a search for the Death mark, bits of which are trapped inside eight musical boxes within the maze.

Having collected the whole tune you then take it to the exit and play it to win. This is not as easy as you might imagine as many of the objects you will find are useful whilst others are actively harmful, there being no way of finding out which is which other than by trial and error.

If the game seems a little overkill then offset by a colourful screen display of, somewhat, low-res graphics. Although the program may not appeal to dedicated arcade players I feel that it caters well for



the market at which it is aimed and should provide the younger sector with hours of fun.

One last comment, the loading screen is one of the best I've yet seen, a most worth buying the program for.

D.J.T.

Fourth Encounters

★★★★

Speakers/Thorn EAT

1250

IBM PC/XT/AT, Expansion

FOURTH ENCOUNTERS IS YET ANOTHER rap-everything-in-eight game for software starved VIC owners. As it stands though it is quite a good shoot out, although hardly original.

The camera inlay instructions warble about a 'power crazy alien force' trying to overrun your planet and turn the inhabitants into slaves. This alien force is sending the obligatory wave after wave of enemies for you to do battle with.

There are various game options which can be selected from the main menu. These include one or two player games, skill level, one phase game, The latter option allowing you to practice any of the first four levels.

The games come in various forms and most of them have irregular movement patterns. Your ship can move left and right on lower levels but can also move up and down on later ones, and of course it can fire missiles.

Well, then about all I can really say about the game. Nothing original with fairly ordinary graphics and the usual 'zap/nope' sound effects. I should thank VIC owners are fed up with shoot 'em ups by now.

P.R.B.

Theatre Europe

★★★★

P.S.S.

1250

IBM PC - joystick

LET IT BE KNOWN HERE AND NOW that I am and have been for much this nasty year a confirmed nigger, and shall continue to be so until I can no longer move the pieces. With this caveat it should be apparent that any war simulation game will come under extreme scrutiny and severe criticism from yours truly, it will have to be good to get past me!

Theatre Europe from Coventry based P.S.S. is an impressive piece of software 'specially packaged in a large video type case, the game comes complete with textual news sheet to set the scene, colour map of the battle area and a thoroughly thin instruction booklet, all of the best quality.

The game itself purports to be "The ultimate conflict simulation" and is set in Europe in October 1918. The object of the game is to either defend or overrun West Germany, depending if you play N.A.T.O

or Warsaw Pact. Although the battle map stretches from Spain to Moscow the actual action only really occurs down the East/West German border, it is possible to move to other borders, but as the game depends on who controls Bonn after 50 days, movement away from Germany is pointless.

Once loaded up you're first confronted with the Playing options, NATO or Russia, skill level etc, after this comes the playing area/map, complete with all pieces in position, there's no alternative start positions. As with a lot of wargames you proceed to play in game phases in phase one of turn one a NATO equipment, phase two is NATO attack etc, then the computer has it's turn (as two player computer has it's turn) the two player option isn't it. Under your control are your land based units, all the Allied Air forces and of course the tactical nuclear option, which is what the game is all about. Running across the top of the game map is the Text line, where game messages, information etc is displayed. Movement of your pieces is by push, as is the allocation of reserves and reinforcements, this system works very well.

This is a strategy game through and through, you will have to think your way

to victory every step of the way. To appear the arcade looks there is a little battle sequence where you can fire guided missiles at the incoming enemy, but the screen really adds nothing to the game and can easily be omitted without loss.

Crucially the display is very strong without being brilliant up to in the sound, but lacks life into imagination when compared to the overall concept and playability of the game, without doubt Theatre Europe is streets ahead of its nearest rivals, the impact when you are finally forced to hit the "NUKE" button has to be seen to be believed. A review of this we cannot hope to do the game justice.

Theatre Europe isn't perfect, on one occasion the game "hangs" for no apparent reason forcing a re-load, a two player option I would have thought was a must and the lack of any other scenarios all go against it, but still P.S.S. have the best game of it's type around.

Any serious wargamer must get a copy of this at any cost, and if by the way don't forget to have your telephone next to you when you hit that Nuke button, you'll need it, and FAST!

Five stars absolutely no question.

M.T.A.





Rockman
★★★★
Masturboid
C64/PS
VIC 20 (unpublished)

ONE OF THE BEST GAMES FOR THE Commodore 64 is 'Rockman', from a very similar game has arrived for the unrepentant VIC. Rockman is an excellent version of this very popular game.

The instructions for this game include a very complex line story which is irrelevant to the actual game. Briefly, it seems that yourative back in your country only to find your father has been murdered by his younger brother. He has then managed to convince your people into believing he is their King. Your only hope is to ask 'the talent' for help. All they do send you into some caves to retrieve 160 pieces of a magical Altar. In there are 16 pieces in each cave making 26 caves in all.

In the actual game collecting the pieces of the Altar is far from easy. Each cave has a different layout of rocks in it. The rocks are supported by earth which you as Rockman can dig away. Also inhabiting the caves are nasty little creatures which follow you round the pits you dig. However, a careful push of a rock onto its head will rid you of it. Once you have collected the 16 pieces in this cave you can head for the exit to the next.

The graphics are all double height and an expanded screen is used. They are all well defined and animated. The sound is also very good although the rendition of 'Popeye' is a little out of key.

This is an incredible game. The programmer deserves a medal for the sheer variety in screens, graphics, sound effects and playability. There is a very nice screen and all in 1.5K of memory! Superb.

F.R.B.

Kikstart
★★★★
Masturboid
C64/PS
C64/64 - available (optional)

ARE THERE ANY OTHER KICKER DAVID Taylor's out there? After playing this game for hours I still can't stay on the bike for more than a few seconds at a time and I feel sure that the skills of the rider, mentioned are required to do anything other than fall off.

At first glance the graphics are not very inspiring but as you play the game and notice the realistic way in which you man falls to the ground you begin to appreciate the complexity of the program.

You control a stout motorcyclist over a wide variety of obstacles ranging from jumps over water, vehicles and telephone booths to rough riding over potholes and through hedges. That is 'you' may control the rider, it forced diamally to do anything of the sort and found the game to be very difficult.

The program comes for two papers by the real intention of a split screen as in RITSTOP 2, player one using the top half. There are eight different sections on which to try you skill, three of which, together make up one game.

The introduction of software of this quality at such a realistic price can only be applauded and should go some way to discouraging piracy, surely most people can afford a couple of quid for an original game. Well done Masturboid.

B.J.T.



BMX Races
★★★★
Masturboid
C64/PS
Commodore 16 or Plus/4

PUT ON YOUR CRASH HELMET AND hold on tight, because there is nothing else or more about this budget-priced game from Masturboid.

Your aim is to complete a sequence of five obstacle courses, avoiding the hazards and collecting water-flaps as you go. If you miss a single flap you cannot complete the course. At the same time your energy is falling, but this can be replenished by picking up energy pods along the way. You are able to jump and manoeuvre rapidly - the only thing you can't do is travel slowly! Lightning reflexes and keen nerves will be needed if you intend to complete the course and win the gold cup.

The quality of C64 games is improving all the time, and this is a very worthy offering, especially at only 11.99. The graphics are colourful and detailed, with very smooth vertical scrolling, and the sound effects are interesting. This is not just a translation of Masturboid's game of the same name for the 64. The controls are superior and well worth trying. Don't expect to finish it in a hurry, though. After several hours play I have still not gone further than course 2.

F.R.B.

Software Spotlight



A NEW GAME FROM TAITO IS always worth watching for and this is no exception, although it is not really original. Its Foreman Pro! you have to protect a series of water pipes into the barrels at the bottom are full. You are assisted by a supply of workmen who, typically, are completely expendable and may be sacrificed to save yourself.

All the features of the original Super Pipeline have been kept, including its nightmare-like quality. Now, however, the nightmare has become most intense as there are constant attacks from scores of suicidal larvae make leaks in the pipe others are difficult or impossible to kill. You race around, collecting workmen to repair leaks and stopping everything that moves! The game is much faster and more challenging than the original.

It is impossible to fault Taito for the sheer professionalism of these games. The graphics are excellent, showing the full potential of sprites, and the musical soundtrack is quite superb. If you actually own Pipeline II, you may think it is too much to pay for what amounts to an upgrade. If you don't, then this is a game you must try to buy!

P.R.L.



THIS GAME IS VERY SIMILAR IN DESIGN and concept to masterpieces often sold for the VIC called 'Rockman'. However it is still a very good game and a gem for its programming in limited memory space.

You must enter the 'Crypts of Darkness' and recover the 20 chalices of truth which have been stolen from your king. Once all the pieces have been found and assembled, then all evil will be banished from the Kingdom. There are twenty Crypts in all, each containing one piece of the Chalice-Guarding the Crypts



are a number of monsters which make your task far from easy.

As with 'Rockman' some very effective data compression routines have been used to give the player as much variety as possible in R.I.P. all memory. The twenty Crypts are all different and contain different numbers of monsters and passage ways. Some screens appear as mazes, some in the form of skulls or outlines of men.

Crypts are all well defined and are in double height on an expanded screen. Sound is also quite good and fairly varied.

Despite the similarities between this and 'Rockman' it is still worth a look especially at the superb price. VIC software is very low on the ground nowadays and I just wished it was all as good as this. Cheap but not mean.

P.R.L.



NO, IT'S NOT A COMPLETE VERSION of Atlantis but a new and rather strange game, in which a series of evil gnomes have to be captured and shoved back into their cages.

In case you are not familiar with the ancient oriental art of gnomes-baiting, let me put you in the picture. Two stages are involved. First you fly rapidly on a magic carpet through a tunnel which wriggles about all over the place. Then you have to strike a succession of coloured gnomes in

the correct order, to neutralise matching musical notes which the game chooses at you. They really are ingenious games!

The game is original and requires several skills. Flying through the tunnel calls for very rapid manipulation of the joystick, while, as well as speed, a good memory will be needed to hit the right gnomes. On the higher levels the colours disappear and you rely entirely on your ear for contact. If you fail, you are not killed but have to start again on the same level. This can become tedious.

The game's graphics are good and there is an excellent sound track. However, there is little real variety, so I fear it might quickly become boring. An interesting idea, but not sufficiently developed.

P.R.L.

Joshua Harrington's Squash

★★★★
Acorn Generation Software
£7.95
CIBAG 64

WITH THE AMOUNT OF TIME I actually spend on the squash court apparently in the name of fitness, probably the last thing I need is a computer for the computer. But then perhaps the best thing it could have is a few tips from one of the all time masters like Joshua Harrington.

Freedom to say this is an excellent game which follows, as closely as possible the proper rules of squash and represents them on screen with brilliant graphics. So on with the action.

You can choose a one, three or five game match as well as the rest of the ball you play with ranging from red, which is easy, through blue and white to yellow, which is hard.

Naturally squash is a two player game and you also have the choice of playing against the computer itself or a human and perhaps more likely opponent. But then the computer player is not adverse to being outwitted. The computer is remarkably fast in this respect. Well as fast as any computer can be!

Surprisingly the game doesn't have to be played using a joystick, although it is easier. Full movement around the court can be achieved through the keyboard using keys which you can designate. Whether you play a back hand or a fore hand depends on your position relative to the ball. To actually strike the ball you simply use the fire key at the end and the angle at which you strike the ball varies according to how long you hold the button down. There are in different angles at which the ball can be hit from the racket.

With the advancement of the game, I guess my future is going to begin to suffer from this more sedentary style of game!

RLM



★★★★
Mastertronic
£19.95
CIBAG 64

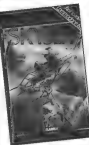
A GRAPHICALLY INCULCANT PICTURE, almost a photograph, of a helicopter appears on screen during loading, giving some clue as to what the game is about.

The aim is to pilot a helicopter, gathering up supplies and equipment for the good guys and delivering them to bases while at the same time avoiding enemy gunfire. It also helps it, in other respects, a few depth charges are aimed at numerous submarines carrying enemy reinforcements.

Nothing special really and on first playing the game did disappoint as the object was more too clear. Clearly soon returned by opting for a low skill level there are ten in all and although graphics and sound were hardly Monroque the game did require a fair bit of dexterity with the old wire and trigger finger.

Once a player comes ad in all was well defined if slightly jumpy graphics, showing the land bases, sea and numerous combinations both afloat and afoot. Sounds could be adapted to personal taste with a joystick controlled option before each game.

Many features about on a different kind of increasing complexity but



detail the game was not compelling enough to persevere through the progressive levels. It was though a typical Mastertronic game, well produced with no pretensions but including a few features usually carried by only the more expensive games. Good value at the price.

RLM

Grubby's Day Out

★★★★
Hyperion Computers
£12.95
Commodore 64 or Amstrack

AS GRUBBY-GRUBBY, YOU PLAY A creature of enormous brain power, hyper-stacking, do I hear you say? In fact you are an intelligent, one-legged frog-like animal, but very endearing for all that!

The scene is set on your home planet of B-loop - a strange land of floating islands with deadly rocks and plants, situated in an energy web designed to contain the wicked bees. You, as Grubby, have a lot of trouble with your chuders, the Grubbees, who keep wandering off into dangerous places. Your task is to rescue them from peril by carrying them back to your cave. To move, you hopscotch using the ground but you can also create and fly, using the immense power of your mind.

Despite the silly name, this is one of the best and most original games I have seen recently. The graphics are bold and colourful, while Grubby's temperaments and the actions of the Grubbees are really amusing. The sound effects are excellent and real skill is needed to avoid the many hazards. There are seven scenes, each showing a different area of the planet's surface.

Had it not been for loading difficulties, and the lack of a score table, I would have given the game five stars from as I recommend it very highly - a real winner!

P.A.B.

Software Spotlight

Operation Whirlwind

★★★★
A: Excellent
L: 11 to 15 minutes (15-20) (Mild)
C: Easy + peaceful

AT LONG LAST! REAL WARZONE simulations are beginning to appear, we've had Combat Commander for some time and for those among us who can afford the \$\$\$ asking price there are the unbeatable 3D games from America. However, reasonably priced good quality wargames just don't exist, and now that is, for Activsoft have come to our rescue by bringing Brotherhood: Operation Whirlwind out as a decent price.

Whirlwind is a graphic 3D strategy simulation, you are the Battalion Commander of an armoured tank force ordered to take and hold a city fifteen kilometres away, between you and it are two more and a numerically superior enemy.



The first thing you are asked to do when loading is to input one of four skill levels from novice to expert, when you're into the game with whizzbangs. As usual with wargames the game turns are divided into phases, Command, Movement, Combat, Assault Order and Assault. Control of your forces, tank armour and infantry is by joystick, position the cursor over the piece you wish the fire button to put up the unit value

and fire again to drop the piece in the required position.

Throughout the game the enemy's unit remains invisible to you until they die, by then it's over to you too, the tanks are a whole sales as you move so that you are not limited to just one screen. The background graphics are really first class, just enough to look realistic and spare enough to give your brain a little more room. The pieces themselves are rather small and can be difficult to differentiate at first but after about 10 minutes play you soon get the hang of them. Sound is naturally rather limited, but it will do what's called for.

Operation Whirlwind is fast, looks nice, plays very very well and keeps you coming back for more time after time. There is however one biggest, enormous, unarguable bug, Activsoft should be told that even with today's sophisticated weapons, shells do not go round corners, in all my years of wargaming I've never before seen a tank shell being so dumb, not until I played O.W. that is. However, don't let this defeat you from buying this excellent game, almost full marks.

M.T.J.

Tower of Evil

★★★★
Creative Sparks
15.95
C: Mild to, S: Slight to R: Embarrassed

IMPRISONED ON THE TOP FLOOR OF an eight-story tower is a beautiful prisoner - whose name is Dana, no less! The building belongs to a wicked necromancer and is protected by a bewildering array of evil minions, glowing at such names as Voodoo and Slaughter. They have only one aim, which is to put paid to you, once and for all.

Fortunately, you are not defenceless - you are able to hurl fireballs from your



fingertips as you race from room to room. On each floor, you have to find a key to get you up the stairs to the next story line (usually is that the hidden trail to get in doorways waiting for you occasionally, however, you come across a magic goblet, which makes you invulnerable for a time. There are also piles of gold, which score highly and give you bonus points when you reach the top floor.

This is a fairly straight translation of an earlier game for the IBM PC-XT. Few changes have been made but the graphics and other things detailed. Fluid combat should note that this game, like one or two others for the C64, will not run on their machines.

It is a good, solid sort of game and worth adding to your collection.

P.B.B.

Hidden

★★★★
Cephane
25.95
C: Slight to R: Embarrassed

HIDDEN IS A HOPEFULLY LITTLE GAME in which you are a fairy - although it is a little better so as not to appear rude.

Your task is to fly around the maze, keep in search of sweet little potions. The forest goblins take the form of an

infinite number of interconnecting chambers, in which the walls, ceilings, plants and moving objects are all dangerous. Any contact diminishes your fairy energy. Occasionally you find magic elixirs, which restore bonus points and replenish your power. There are also lucky charms, which are worth recovering, though you can only carry three of them. Having found the potions, you must take them to the sweet flowers of flowers to make them bloom.

To add interest, some of the chambers

are in pairs but require, with just the eyes of one speed-shifting occasionally. There are very troublesome as you can bump into hazards and lose energy, without realising they are there. In other corners force-fields block the doorway. Teaching one of these makes you become all over the place - and on one occasion caused the program to crash!

The game is pleasant but, despite the basic element, there is nothing very new or interesting about it.

P.B.B.

Parky and the Yellow Submarine

CIBA 88

THE MORE YOU KNOW ABOUT THE YELLOW Submarine is the more you enjoy the game. Parky the penguin is lost in the depths of the South Atlantic submarine caverns. But like all South Atlantic rescue missions there are plenty of hazards to make the task of the U.S. Navy not so easy anyway! To make it even worse you can reduce the number of lives you're allowed as well.

Lives are lost by causing Parky to bump into the cavern walls and by failing to avoid the underground nasties. There are also three different skill levels. The higher the skill level, the longer your starting bonus which gradually melts away as you move around the caverns.

Dotted around the caverns are planes of fish and drops to give you extra energy and bonus points, lanterns to make Parky visible and smart bombs which can be used to destroy all the nasties in a cavern.

So much for the positive points. But then I haven't told you that there are 97 caverns to search, that there are robot doors that can only be opened with the right colour key and the three parts of the mysterious 100 submarine have to be found before Parky can be rescued.

Oh I almost forgot the special 'help' letter. Collect all the letters in the right order and as the bombs, lanterns and fish disappear in all of the caverns just in case Parky needs them. (and in case Parky has a bit of a conscience the package contains a map of the caverns, which, if used to plot the positions of all the items, could win you a free copy of Parky's next adventure.)

Just hope it's in the warmer climes of the South Pacific. **B.94.**



Bounty Bob Strikes Back

U.S. Gold
(1440) (4000) (1475) (1480)
CIBA 88 and joystick

BEHIND UNDER THE ALL TIME TOPPING U.S. Gold label, Bounty Bob is billed as a sequel to Miner 2049er and as such finds Bob once again jumping from platforms to platforms in a vain attempt to escape the mine, 'found familiar?' it should be as in the mine, the game follows the well-worn format of a platform game.

In all fairness the author has added a mass of facilities by which the program can be tailored to your individual tastes, difficulty level, number of lives, etc. Unfortunately these parameters are



Quasimodo

U.S. Gold
(1440) (4000) (1475) (1480)
CIBA 88 - joystick

U.S. GOLD ARE BRAGGING MORE widely than ever for the 64 or Int and Quasimodo is the latest in a long line of, in the main, high quality games. Unfortunately I wonder if they are perhaps rating programs onto the market as some of their recent releases are not quite so good value as were their earlier releases.

Having loaded Quasimodo, which is on their usual very reliable test bed system, you are faced with the task of protecting Quasimodo from an army of archers who use a ball on which he stands. Their tactic is a simple one of shooting and a looking dodgers whilst firing

selected with joystick part 2 whilst the game is played with part 1 which means that rather you use two 'sticks' or you change parts without powering down that is less recommended.

There are surely five screens, at least that's what the 'help' says, the panel of buttons were unable to achieve more than level five.

Each level requires the manipulation of a piece of machinery. For example, screen one requires the use of a matter transmitter, screen two a lift and screen three a custom table. With graphics that are adequate rather than amazing, good sound and a high score table (amazing, the program would have put a higher rating if it had been a pound or two cheaper, as it felt that it's somewhat overpriced. Read and write what you think.

arrives at you. To dislodge them you drop custom balls taken from one of three bags on the wall top. As the last of the archers fall to their deaths a jewel is... appear and upon receiving this and playing it into a case, you are transported to the next screen.

Now you may take a breather as completion of level two requires agility rather than volume (large balls hang from the top of the screen and Quasimodo must make his way to the opposite side of the wall by swinging from ball rope to ball rope in order to find the second of the three jewels).

The game makes good use of the 64, using 40k of memory, and contains adequate sound and graphics, the animation of the main character, in particular, being very good. However, not quite up to the standard that we expect from the company. **D.17.**



Software Spotlight



ONCE UPON A TIME THERE LIVED A beautiful Princess. There also lived a very bad young man who traveled to the strange land where the very Princess lived. The young man fell in love with the Princess and asked to marry her. However the Princess' father, the King, wanted the young man to prove himself and so sent him out on seven dangerous tasks.

There also lived a computer programmer who decided to write a game around the very interesting plot. He wrote the game so that you could play the part of the bold adventurer on the quest of the seven tasks. Unfortunately the programmer did not make the game very playable...

Of the seven tasks I have so far managed four of them. The first task has you fighting off Zombies for a night. You must move about shooting at them to keep away their fatal touch and the sun rises.

The second task sends you into a forest in which lives a number of wicked wizards. Again you move around



shooting them. In the third task you have to collect four stones whilst avoiding off blood sucking bats. The fourth has you shooting evil Wizards. What comes next I don't know as by this time I was getting very bored and even more frustrated.

The graphics are well done with some weird style letters. The sounds are large and well animated. Sound however is very sparse. The instructions tell you that each task brings a new challenge. I don't agree, they all involve walking about tapping different spots in the same way as the last screen.

It's up to you to find out if the beautiful Princess and bold young man live happy forever after.

P.A.L.



HELICOPTER GAMES SEEM TO BE getting fairly popular on the '64. What with Aerosol, Super Huey and various others we are getting quite a good selection. However, Chopper is not in the same class as most of the other games.

You are played in the pilot's seat of the latest and most deadly helicopter gunship your airforce has produced. Your mission is to destroy an enemy base built into the side of a cliff. Of course this is an almost impossible task to achieve.

The mission is made up of three sectors and a refueling stage. The first sector is a scrolling dodger's. You must zip, zap the enemy helicopters and planes without avoiding their gunfire. One nasty glitch is that you cannot move up or down while you are firing. The second sector is a scrolling dodger's. You must fly up and down avoiding the millions of snakes and bullets which have suddenly exploded the sky.

After each of the first two sectors you must dock with a large plane to refuel and gain more points. Then on to the next sector.

The last sector is the most difficult to complete. You arrive at the cliff housing the enemy base. You have to destroy three tanks by successfully firing a bullet down them. This is far from easy as two indestructible helicopters move up and down as you do. It is very difficult to outwit these craft so that you can deliver your shots accurately.

Some nice graphics and pleasing sound effects make for a fun game. Unfortunately a bit becomes unresponsive in the end. Various play options and a high score table don't prevent the game from becoming dull.

P.A.L.

Realm of Impossibility

by
Anaphant
Commodore 64

JUST BECAUSE SOME BODY CLING called World Wars and the seven sectors of the middle kingdoms you have the rather dubious, and not especially amusing, task of searching the 13 dungeons strongholds for the crown and get out alive.

Once inside the dungeons - which you can choose from one by one - you are chased by on-screen oggles loosely described as zombies, vultures and orcs. These decrease your hit points if they touch you. And they do this until you die.

You want to know more? Then don't read the meek instructions, because they don't even bother to tell you that you need the flip side of the tape loaded to get the game under way. Duh! eh! Well as you've probably no doubt guessed I was about as on-eye as most as the graphics and signature line were unimpressive!

K.A.L.



Ice Palace

by
Creative Sparks
\$3.95
C-84444 • joystick

A REAL-TIME ACTION ADVENTURE SAYS the play card, and it's prepared to believe there are 1000 locations and seven levels of play as it says.

Ice Palace opens with atmospheric medieval themes, promising magic, and totally in keeping to the quest in hand of finding the seven pieces of the Ice Queen hidden in the Ice Palace and guarded by the Ice Queen and her magic, mages.

The fact that it is played in real time soon becomes painfully apparent as (and usually was when time runs away at an alarming rate, mainly because moving the heroic Prince about is so fussy). While joystick forwards moves the prince forwards, left or right joystick rotates surrounding hexagonal shaped rooms. Joystick back rotates the floor. No way rotating from room to room here - more different actions may be required before moving to the next room.



The screen displays an aerial view of the hexagonal grid showing the hero and different symbols representing attacks, barriers and hazards. The complex movement mechanics, however, usually result in a rather odd ending with gloomy music signifying the prince's demise. Overall it's a pretty gloomy, escape.

Access can be had to an 'adventure' screen giving a menu of actions to be performed but the time is given to consider choices. A hint about this is not. As the total action is performed a scale indicates the rising rate of the Ice Queen's hold over the adventure and before you can say 'disappearance' or such other hallowed words, the game is lost.

While being quite appealing, the game sits on the whole system. Too much thought seems to have been given to a movement and no quite unusual to performing even the simplest of tasks with little consideration of how this would fit into the overall structure of a game which is really a major game with a time limit to beat. Very few games have successfully combined the excitement of the arcade with the intrigue of adventure and Ice Palace is sold on this deal. **B.M.**

**Mr. Bouncer!**

by
Mirrorsoft
\$8.95 cassette disk \$2 extra
C84444

THE FACT THAT THE MR. MEN FEATURE in this game might lead you to suppose that it would be suitable for very young children, and that impression seems to bear that out. The graphics are chunky and attractive, with bright, primary colours like a story-book, and the musical accompaniment is catchy and pleasant.

Take a pop it is such a wacky game! I guarantee that any child under the age of twenty-six will be screaming with frustration within ten minutes.

You control an unnamed Mr. Men who can move left or right and jump. Your objective is different on each of the four screens but you must, at all costs, avoid contact with anything which moves or you will lose a life. Each time that happens you must wait, getting more and more anxious, while your Mr. Men bounces aimlessly around the screen for what seems like half an hour!

The game is not just difficult and annoying; it is practically impossible - yet it sits on the shelf that it is suitable for young children! Sorry, Mirrorsoft, I suggest that you send Mr. Bouncer to that happy bouncing ground for software in the sky, where it surely belongs.

P.R.B.

Dave Crisp takes a look at some of the modems that are available for Commodore machines.

MODEM

PROBABLY A MODEM IS A MODEM. If it works you are equal to a lot of others. Most extra facilities, features you pay for! Only most life starts with an idea as to how it you had to buy the cheapest available your machine messages will look the same as the person with 100.00 set up.

I know of many instances where the modem has been purchased and the user has wasted days for their Prestel number to arrive. Don't put it there. Dial up a Prestel number and use the identification ~~xxxxxxxx~~ and the the password ~~xxxx~~. This will give you access to many interesting demo-pages and will allow you to get the hang of moving around Prestel. A so do not forget Bulletin Boards. There is nothing to stop you going around some of them. If you have a modem which can only use 1200/75 do not worry as more and more BBS are using this mode.

PRISM 1000

The Prism 1000 was one I took a little while ago but it is worth re-opening in order to let new readers see what it is all about.

It is not the most sophisticated of packages, being limited to 1200/75 and 1200/1200 but to those just starting out in communications or those who know they will be wanting sometimes services then it is quite adequate.

The Prism 1000 is certainly underlined by services. There are only two. One offers 1200/75 standard or 1200/1200 the other offers 75 but once you have dialled the computer and found the tone.

The important part of the Prism set-up is the software which comes with it.

The cartridge based OS, package was easy to use. Everything being more or less self-explanatory. It is worth mentioning that if you have an SA-64 the cartridge will not fit and so a little 'tucking' with a 'sawtooth' knife and saw would be required to make it fit the cartridge port. The problem is the short 'neck'. It will not allow the connector to make proper contact with the socket.

When finally connected up (the instructions could have been better) and powered up, the on screen menu will provide you to get going quickly.

Presuming that you have entered a validata type survey the procedure is as follows. Select option 6 (LOG ON/OFF).

This takes you to a sub menu which allows you to auto log on, Manual log on or log off.



I may be wrong but it appeared that irrespective of whether manual or auto logging on was selected you still had to input your ID.

Once the description is made and you have input your ID, the screen clears and tells you to phone the computer.

Lump the telephone dial up and wait for the tone. Once heard throw the on/off line switch down and after a few seconds contact should be made. Once the line has been secured you should be able to put direct your message but on my set-up it I did that the line was disconnected. This left me with an option to which all sorts of hope politicians usually say it children had unprotected access. It wasn't though that it may be a lack at my end rather than with the modem.

The other options available from the power up menu are: (TRANSFER) This allows you to return to veridata service after performing a function such as print frame. (SAVE FRAME) This enables you to save a frame to tape or disc and is useful on pages such as timetables and so on. (NEW FRAME) From here you can load up a frame that has been previously saved to tape/disc.

(PRINT FRAME) Probably here but I must read carefully. I could not get a printout on my Casio/Compaq set up which

emulates an MP6001 with an emulogers I have had. I know quite a few people have been able to dump on an MP6001. It would appear that it is set up to print only onto a terminal/printer connected through the user port but I have a feeling that in the distant past I did get a mailbox from someone who said you could dump to the RT. If you are out there and reading this please get in touch again as the method used would be worth putting in the mag.

(DOWN-LOAD) This allows you to download the hopefully small amount of software available on Prestel/terminal. What is there appears rather dated and suspecting, however for the time being I did find that downloading results were consistently good. There is a check on each frame and up to give attempts get made to download the frame before the software starts. I only had one failure in 10 attempts.

(MAILBOX) With this option you can prepare, edit, mailbox messages to be sent with either Prestel or not to user. The users telephone number and so keeps the phone bells down. When preparing a new to use with Prism, have in mind the size of the page you will be sending on as it is easy to over type and find your message will not fit the page.

(USER COMMAND) This allows you to connect up with other Prism users and

MADNESS



either send/receive lists, send receive mailboxes, or enter CHAT MODE. Chat mode allows you to "talk" directly using the keyboard. I find though that the built-in send options called "speech" is often quicker and more effective.

I only had chance to have a very quick run through user's man. The results were not very good but I suspect that the problems lay with certain telephone sets not to find modems still.

In conclusion

For the money the Prime package with software seems a good buy. It is a shame that it does not support 386/387 but one cannot have everything.

I found it easy to use with only a couple of small niggles.

There is a good second-hand market in modems and so I feel that this would be a particularly good buy for the first user. You would be able to check out communications and see if you liked it and then either sell it to upgrade or sell it and pack up.

Minicube Technology

This is the one for anybody who loves switches and I/O's. The Minicube Technology modem certainly looks the part. Three Rotary Dials and 5 I/O's and

two more listening makes the look and feel do everything. Well, it comes very close.

This one steps up much to some of the options are restricted by a stop on the switch in order for it to comply with current Telecom approval specifications.

Now, I say it seems to do nearly anything, in practice my review model did virtually nothing. Why? Well when you buy the Modem that is practically all you get. On its own it would not do anything except a self test. The thing you would need to buy to get everything going is communications software.

Supplied with the Modem is an RS232C interface which plugs into the rear port of the M and into the modem. Even a cable that the user port plug did not have a straight-through secret as many people have Commodore printers connected via the user port so as it stands there would be a certain amount of plugging/unplugging involved.

The Features

On the **HARDWARE** side the RS232C offers the following:
280 baud Full Duplex
480 baud Half Duplex
1200/75 bauds
75/120 bauds
And if you are outside the restrictions of

BT there is also 1845, 192, 202 Compatibility.

There should be something there that most of you will want, I particularly like the 280/380 options. As I said on its own its virtually useless and you will need to get terminal software in order to make use of your Modem.

I could see that if you were new to the type of thing you could end up disappointed, and somewhat poorer, if the need for communications software was not appreciated at the time of purchase. This could have been made clearer. I may be wrong but a message passed to me indicated that in future the modem may be supplied with fairly basic communications software so you could at least get going from the start.

I understand that one piece of software that goes together well with the RS232C is the Comm software from PM Laboratories. This did not arrive in time for it to be used in conjunction with the modem which would have made it a more meaningful review, however if that software is as good as some has it then may be worth getting a subscription of the magazine.

My conclusion on the RS232C have to be drawn from the information in the manual.

It seems to offer most things and would, with the right software be a versatile tool. The documentation is fairly comprehensive but I found that it was heavy going the first time through. Of course once connected to good software most of the Modem's manual becomes redundant as options will be controlled through software.

The most unsatisfactory conclusion is that I think you would enjoy using the RS232C, but be aware of the extra hidden costs of Comm software.

Tandem TM300

Could this be the cream of the Modems I had for review?

It did not seem quite as varied as the WS300 on options but where this set up scored was with the cartridge based software.

The TM300 is exactly the opposite to the WS300. Where the WS300 has masses of switches and wiring the TM300 has nothing. It can be the computer, like a reversible mouse giving no indication of what it is.

In use though it is different. It will handle 1200/75, 75/1200 and 300/300 allowing you to choose parity and so on. All under software control.

Little can be said about the Modem and except that it is impressively silent. You could easily forget it.

Inside there is what appears to be considerable RAM which remembers your password and ID (optional) and stores a





but of your front office used computer numbers. This saves much time and makes it very, very easy to use. No setting up just plug in and go.

No manual intervention is required to send the file, the modem does all that when you have dialled up you can hear through it's built-in speaker like during some o.c. When you have the tone it shuts off and you are away.

The cartridge

The cartridge is the brain behind the outside plug-in and the master menu is permanent.

The options are as follows:

1. MODEM MENU

This takes you to the dial menu. After programming the numbers in when first used you select the computer you wish to call and the modem auto dials.

2. SELECT OUTPUT DEVICE

With this you configure the doc./printer type you have. This would need to be done each time with a conventional set up, but with a T04T as device B and a Commodore type printer this option can be ignored.

3. SELECT DOC. PRINTER

This allows you to load from tape or disc a previously stored frame.

4. DOC. FUNCTIONS

From here you can display a doc. directory, format docs, scratch files and so on.

5. LOAD AUXILIARY PACK

You can load external programs designed to run with the LANDRA cartridge. These may give you extra functions.

6. TEXT HANDBOX

If for the Presto modem this allows you to prepare or not stored mailframes in order to save on line time. Again the same problems of text longer than a page can be solved.

7. EDIT MAILBOX

This is almost the same as TEXT HANDBOX except that like one, to be edited is available only in memory and not stored.

8. TERMINAL VIEW

With this option you can enter 300/300 mode. When connected to your BIL or semi-data service from terminal mode the same will scroll and as possible to direct output straight to the printer as well as the screen.

When you are connected to a service there is a second menu which is called the ON LINE MENU.

From here you can:

a. SAVE CURRENT FRAME

b. GO OFF LINE (LOG OFF)

c. SEND ASCII FILE

d. SEND BASIC FILE

e. TOGGLE CALL TIMER. This is a built-in real timer which is displayed on the bottom line of the screen. I find it very useful but it is surprising how fast the minutes tick away when you are on line. For a change this clock seems quite accurate.

f. SEND EDITED FILE. This allows you to send a discpage based frame.

g. SEND RAWED FRAME SERVICE. This allows you to send the file edited in memory.

h. PRINT FRAME

i. SERIAL. With this option you can display hidden Presto data, e.g. Answers to your questions and so on.

j. DOWNLOAD TUTORIALWARE. I had little success with this one. The Landra system requires the use of a tokenring program and repeated attempts, only resulted in failure. I shall be trying again soon.

k. SEND 800. This is almost a clear screen when on line to Presto/Maxcom.

l. CLEAR MENU. This warns you to the point you were at prior to calling earth's menu.

For me the Landra was the best of the three with certain reservations.

The failure of telepointers downloading was disappointing though there is to little on PREL/MNet at the moment I can not wait for it. The next is the price. The T4200 must be in the luxury class, but you get what you pay for and to me it does seem a fair price for a piece of equipment with high specifications.

Having the cartridge based software and the auto-dial facility means that I could get on line very quickly with no setting up and I found that an advantage as it is not unusual for me to log on to Presto 1 or 2 times a day.

Which one

Any of them is all I can suggest. They are all good in their different departments. Much depends on the amount you can afford to spend and your reasons for wanting to go on line.

Before I finish I think I should point out another Modem which was reviewed in an earlier issue, The PROTEK. Still the cheapest on the market, I still use this Modem regularly and find it reliable. The software could still do with reviewing as you can often end up with screens full of garbage but for the person who wants a cheap but effective Presto terminal and one which is portable I still think it takes some beating.

Commodore also produce a modem for the 64. However this modem will only work in 1200/300 local rate mode and has been covered numerous times in the magazine already. It is a good modem, it works well and provides a free subscription to CompuLink with its first month we will be looking at CompuLink and this modem in a greater depth.

If anybody has any impact of information they think may help other readers or readers or printers and so on, why not leave me a message on Presto. My Presto ref no. is 1564M001. It will be pleased to hear from you.



Get more from your Commodore 64

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Jack Hampshire

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**Tony Dennis explains exactly
what you can do once you
have bought a modem for
your Commodore.**

BUYING A MODEM GIVES THE Commodore 64 or the 28 user access to a wealth of information stored on mainframe computers all over the world. But many enthusiasts soon become disillusioned because they cannot find any interesting telephone numbers to call. Here is a brief overview of the different telephone accessible services some are free - others charge for access - one on the free computer. Start with the basics and then decide what's worth paying for.

An obvious route for modem users is

Commodore users. At most times at least one of these will have a free rental subscription to *Microtel* with the modem.

Commodore UK itself decided that its radio users (and currently only 64 owners should have a service of their own. Hence it got together with a computer bureau company called ADP and Compuserf was born. The service can be accessed only by those who buy the Compuserf modem (around £290). It was pages of information too (listed but the commands are much more sophisticated).

A list of commands is displayed at the bottom of the screen with a cursor highlighting one of them. The caller moves through the list of commands in either direction to get to the one required. It is known as a dumb sheet as it is possible to route through the list and you arrive back at the starting point.

Compuserf also has radio news, several available for downloading and

Comuserf is now commercially available some enthusiasts have begun to use to run their own bulletin boards.

What are Bulletin Boards? They are messaging systems run on microcomputers by enthusiastic amateurs. When connected up to one, the caller is able to read and send messages to fellow micro-enthusiasts on virtually any topic. It is possible to send private messages to an individual as well as public ones. Most boards have several interest groups (SGs) and there's nearly always one for Commodore users. The SGs are particularly useful for asking other people's advice on micro problems, picking up the latest goods and news on products, and even meeting other enthusiasts locally have free software for downloading and some of it will undoubtedly have been left there by other local based Commodore users.

Microcom, Harbourn and Comuserf boards can all be accessed using *Protel*

COMMUNICAT

to subscribe to *Protel*, it is run by British Telecom and was originally devised for people to access using their television sets. That is partly why the information is displayed in the form of colour pages, and (usually) everything is done using the ten numeric plus enter) and (back).

Taking out a subscription to *Protel* gives access to a whole bunch of databases operated by travel agents, banks, building societies and manufacturers. There are also devoted to the legal profession, financial information such as currency and share prices, and education as well as electronic mail for most Commodore owners though, it is well worth taking on a *Protel* subscription through Microcom. This area is part of *Protel* Microcomparing and therefore subject to minor deviations. Microcom has all the latest macro news services, free and chargeable software online waiting for downloading and, of course, games. Microcom also happens to be one of the most accurate parts of *Protel* with a very local base of subscribers which number roughly 75,000.

To get onto Microcom, a 10800/75 baud modem and *Protel* compatible software are required. Don't worry because Microcom, Modem House, and Tandy, among others will all do the necessary for for

electronic mail. The most popular part is *ALLS* (available through Compuserf & Comuserf) game that originally started on *Amiga* (Comuserf's computer is every much like the board game with words, quips and innuendo to find). The difference is that the players are actually on-line together and can be taking from any part of the country. Beware because the game is so addictive that enormous phone charges can easily be run up. Certainly who supports the game for Compuserf also charge for playing time Comuserf's will do its utmost and thus a much smaller database than *Microcom*.

Both Microcom and Compuserf can be accessed for the cost of a local call from most parts of the country. However, they both charge for subscriptions to their services. Luckily there are some services which don't have local authorities like *Travels* have bought services which have free areas for the general public. They are *Amiga* look and if you live in the area or - in the case of *CoView* - fairly a holiday in Rochford. The BBC's services for experienced youngsters to learn computing skills operate via satellite services, too. Both *UK* Radio and *Comuserf* wires to these boards tend to be very difficult.

The SGs run software developed for the BBC known as *Comuserf*, there

software. There is also software available for the Compuserf modem which allows it to be used with *Protel* and even includes the special Microcom downloading protocols, but Bulletin Boards almost inevitably require what has come to be known as 'travelling' software.

Instead of displaying information in the form of pages, many like Bulletin boards send it in a continuous stream. Thus as the screen fills up, the first lines start begin to scroll off the bottom. In order to access such services an alternative necessary to have what is known as a terminal program. *WIP* terminal is the most popular of this type of software.

Bulletin boards also operate at a different baud rate (data transmission speed) from *Protel*, *Microcom*, etc. For this a different modem will often be needed. The cheapest is from *Teletek* which includes RS232 interface, modems and software all in the same unit. With such a modem another huge group of services can be accessed.

The most popular are electronic mail services like *Telecom*, *Gold*, *Easylink*, *One-to-One* and *Comnet*. They are mainly aimed at business users since they are a very cost effective method of sending letters. Unlike Bulletin boards, these electronic mail services can have hundreds of callers accessing the system



multinationally.

Many companies which kept extensive databases on mainframe computers found that they too, if not a couple of the costs by making the information available online. In return for subscription fees or on other basis, hundreds of pounds is available to access the financial times service, Enr or Hazard parliamentary records kept by Enr etc.

Most such information providers are not anxious for one user to subscribe. The exception is an American company called Data which offers a premium service for those with microcomputers. Known as Knowledge Index, it gives access to a wide range of databases which were considered to be of general interest. The cost is not too great, but naturally the service is only available at offices or when business subscriptions are not ending. The most exciting thing about Knowledge Index is that British

calendars are actually connected via an international data networking network to Data's computers in the USA.

Naturally it is not possible to access American services direct because their modems use the Bell standard not CCITT as in England. Thus the two really exciting services for micro users in the Main, Computer and the Source are not really available.

The way around this is to pay for a packet switching account (PS) from British Telecom. Packet switching users are still at different times periods as well as sending up their own direct. To access Computer Source in a British Commodore user has to have a pay for the use of a local call, the cost of PMS, plus subscription and connection charges on Computer use. It's not the thing for low income modems either.

North American Bulletin boards use Bell frequencies but are not connected to any packet switching service. The user will

thus need a modem which supports Bell requirements. However, contact with our American contacts is possible via UK Bulletin boards which switch to Bell requirements at night. In the UK, Britain and Malibu 800 is popular.

Latterly most of the rest of the world uses CCITT modems but in Britain, even therefore phone boards in Europe, South Africa and even Australia. Naturally, the phone bill will be vast.

Finally, modem Bulletin boards come around to wanting to run their own Bulletin board as that instead of making outgoing calls to everybody phone their. Currently I know of only one system which allows Commodore 64 owners to host a board and that is Quarktron. Available in the UK, it is handled as a data service. You would need to be very keenly thought before users are substantial number of people but called, this costs time but not necessarily low.

Simon Harding

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UK 300 baud bulletin boards

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David Janda takes a look at some programs to enhance your 64.

BASIC EXTENSIONS

THERE IS A WHOLE RANGE OF BASIC language extensions available for the Commodore 64. You could be forgiven for asking what the answer to that question is twofold. First, the Basic on the Commodore 64 is quite simple enough. Taking into account that the 64 often gets, colour and sound it is amazing that Commodore didn't produce a Basic to utilize these features.

Secondly, the memory map of the Commodore 64 is very flexible. Many people refer to the 64 as being a 'soft' machine. This is because it is very easy to re-configure the memory map, add extra real commands and so on.

In this, the first part of a two part series, I shall be taking a look at some of the extended Basic available. Please note that it would take months to cover every one, so we have selected the most popular ones currently available.

MCT Basic — Micro Component Trading

One problem faced by software houses who produce this type of software is how to incorporate the comments. What comments do you incorporate into a Basic extension package?

The producers of MCT Basic have overcome this problem in a novel way — they have added commands and functions that are compatible with BASIC V1.0. In other words, the extra goodies are based on the C16 and Plus/4.

The MCT Basic package consists of a temporary disc cassette loader with two cassettes and documentation. The first cassette (incorporating the Nivaload system) loads the Basic extensions which include an assembler, whilst the second contains a screen painter which is written in MCT Basic. Documentation is supplied in the form of a 23 page booklet which describes (in small print) the operation of the commands in a concise manner.

The package includes extensions which cover three main areas. If no there are the C16 and Plus/4 add-ons, next comes new Basic commands followed by programming aids.

The user interface of the screen-painter has also been changed with the addition of 17 new keyboard functions. These functions are accessed by pressing the ESC key followed by a letter and



perform operations such as line delete, screen scroll up/down and so on. The same functions can be used within a program by using the PRINT command: PRINT CHR\$(27) & "ESC00".

Where 27 is the ASCII code for ESC and 00 is the code for a letter that performs a function.

The four standard function keys have been made more accessible by the GET command which has two forms. Entering key in direct mode will display the current function key settings. GET number, "string" will assign a string to the specified function key.

A fairly comprehensive selection of graphic commands are included in MCT Basic, five graphic modes are made available with the GRAPHIC command.

The graphic commands include COLLOC, DRAW, CIRCLE, BOX, POINT and so on. Tight space commands are included.

Programming aids include the essential AUTO, RUN/LABEL, GOTO, OLD, TRON/TROFF, HELP will highlight an error in the program and TRAP/ESLAME/ESL wrap allow the programmer to trap errors — very handy when debugging.

MCT Basic also includes a whole set of improved and new commands. PRINT can now use LPRINT (for screen formatting). BEEP(0) can be followed by a line number and NEXT can be used on the left of an argument. Added control structures include IF...DO...LOOPE, DO UNTIL...LOOPE and DO WHILE...LOOPE.

It's a great pity that the package doesn't include a facility to incorporate the extensions within your own program, without the use of the main MCT Basic resource. As it stands, MCT Basic provides a well balanced set of new commands and functions which are both useful and functional.



EXTENDED BASIC — Mushroom Software

When I first looked at the instruction manual for Extended Basic, I thought I was looking at the BBC User Guide! The package incorporates some commands found in BBC Basic including an on-line three pass assembler.

Extended Basic from Mushroom Software includes 47 new commands that are divided into 13 groups. As mentioned before, a three pass assembler is incorporated within Extended Basic, and in the opinion the package is worth buying for that alone! (Mushroom Software may be interested to know that an updated version of the assembler can be purchased separately for £5.95.)

The package includes quite a few commands, and it is not recommended for the absolute beginner. I can understand why, as many commands are related with each other in some way — the sprite commands being an example.

Although Extended Basic covers a variety of programming requirements, graphics and sprites are the main theme of the package.

The graphic commands directly deal with the colour settings for the paper, ink, and so on. The MODEM command selects the video mode and is configured as shown in table 1.

The COLOUR command within the here group will explain MODEM a little better. Basically four colours are available in MODEM. COLOUR page is used to select a physical (p) colour from the palette of 16 and assign it to the paint (p). To actually select a colour to be used in high-res drawing the PAINT command is used. Paint also has a second parameter which selects one of five backdrop operators to be performed on the drawing.

Extended Basic is quite a complex package that offers numerous commands. Yet I believe it is overcomplicated in some areas, and also feel that the operation of some of the commands could have been implemented in a more easy to use manner.

EXTENDED BASIC — Duckworth/Bug

A major problem associated with extended Basic is compatibility. A software house will try and do better than the next one by providing more and more sophisticated commands and functions. For the novice programmer who has just learnt Basic but would like a few more commands available in the order of the day.

Nevertheless, I was pleased to use Extended Basic from Duckworth/Bug Software. This cassette based package offers the user 27 new commands that

either add new features, or replace complex FORs.

The commands provided in this version of Extended Basic are simple but practical. One command is used to set the screen mode whilst another selects the graphic mode.

Colour control is achieved with just one command — CHOCOL. Colour is followed by eight parameters which correspond to the colour registers with the bit.

Graphic functions include a basic PLOT command for use in both modes. The DRAW command is followed by two or more sets of co-ordinates, and draws a line between the points specified. POINT x,y,z will check the screen location pointed to by x and y for a colour whose number is held in variable z. In other words, it's a function that would be used as an argument with an IF statement.

To round-off the graphics side of things, TYPE will display a string of characters in both graphic modes. The size specifies the x and y co-ordinates as well as the height and width (in pixels) of each character.

I was highly impressed with the way

the sprite commands were incorporated in this package. The sprite shape is defined by using the SHAPE command. The user enters SHAPE on one line, and the following 31 lines are used to define the shape itself. Each line starts with a double-quote and whenever the foreground is to appear a "1" is entered. The background is represented by a "0" and nothing, by nothing! Using the remoted enables you to instantly recognise the shape of a sprite when looking at the program listing.

SPRINT is followed by seven parameters which set the shape, style, x and so on. The next two commands are very handy! SHCOL(x,y,z) and move sprite to x co-ordinates x,y while COLIDE(x,y) which checks to see if sprite x has collided with another sprite as background. The amount of time taken to be checked in % timer is specified by y.

It was a real pleasure using this Extended Basic. The commands are just right for the less experienced programmer and I would also recommend the package to the more experienced user wish to get some quick results!



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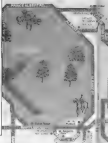


More and more games are appearing on the market that are based around television series or films. Give My Regards to Broadstreet from Argus Press Software being an excellent example of how a game can be made from a film plot.

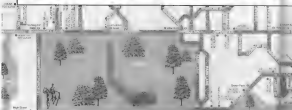
Both game and film are based around Paul McCartney whilst trying to find some missing sections of the master tape for his latest album. In the game you play the part of Mr McCartney and must dash around an authentic map of London trying to locate your friends to see if they have the missing pieces.

Argus Press Software are making it possible for a winner of this month's competition to spend some time with the star and author of the film Paul McCartney, teaching him how to play the game.

The prize being offered are, 1st Prize, a trip to London for lunch and the chance to spend some time with Paul McCartney in his London studio; five copies of the Broadstreet album and ten copies of the video; Plus 50 runners up prizes of £10 of new software from the current APS range.



COMPETITION



What to do

Firstly you will need a copy of the computer game as all of the competition questions need quite a lot of familiarity with the game in order to answer them correctly.

If you don't already own a copy of the

game we have included a voucher that will give you £1 off of the game. A order one to be sent to Argus Press Software at the address shown on the discount voucher.

Secondly you must sit down and play the game and you are sure that you can answer all the questions correctly.

Then fill in the competition entry form

with your answers and the validation questions in case there is a tie.

Complete the competition entry form, not forgetting the validation questions, and send your entry to Broadstreet Competitions, Four Cammelford, 1 Colindale Avenue, London W9 1AB. The closing date of the competition is 31st August.

ON

Questions

- 1) How many people are there in the game?
- 2) What make of car does Paul drive in the game?
- 3) Where do you qualify you've collected the missing notes?
- 4) What tube station does George Martin come out of after leaving Hush-ho?
- 5) In the Game, which tube station shows you the tower of London?
- 6) Which tube station do you go to to win the Gold Justice pub?

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Make your graphics programming easier with these helpful routines from AP and DJ Stevenson



MASTERING MACHINE CODE

MAPS, ROUTINES ARE PROVIDED here and are given in assembly language form (program T1). All the routines are used by the function plotter program described in this month's BASIC FACTS article. A few loader programs, with the object code in DATA statements, is given and should ease the task of typing in the program. However, if you wish to modify or improve the routines then the Assembly language listing is the best course of action. Please make sure you SAVE the source code on tape before attempting to execute any code. A simple typing error or omission will almost certainly cause the system to crash.

The routines

Programming high resolution graphics, using standard CBM64 BASIC, can be rather tedious. In addition the execution speed can be painfully slow. A few simple machine code routines, of the type given in this article, are very useful in areas such as graph plotting especially if they can be called from BASIC (figure 1 lists the available routines).

Clearing the bit map area

Before we even start using hi-res graphics, it is necessary to clear the bit map, an 8000 byte area of memory, corresponding to a graphics screen of 512 by 256 pixels. This area is normally placed at address \$2000 (\$100 decimal) but can easily be repositioned. Clearing the bit map with a series of POKEs from BASIC will take several seconds to execute whereas, a machine code version would appear to

execute instantaneously. An example of such a routine is that of CLEARMAP given below.

Setting up screen memory

Two colours are available in high resolution mode. A one byte number is used to set up the two colours that are available. The upper nybble specifies the colour looked like 10% of any pixel represented by a binary one in the bit map. The lower nybble is the colour code of any pixel represented by a binary zero. The desired combination of colours are POKE'd into the location labelled SCREEN (\$14 has a 254 decimal) prior to a call to INIT or SCREEN. For example, POKE(\$14,7) would specify black graphics on a yellow background. Refer to the program breakdown for details of the coding.

The INIT ROUTINE

This routine sets up all the default bit map addresses and screen memory and calls the CLEARMAP and SCREEN routines. It is also responsible for setting up the raster interrupt SERVICE routine by vectoring the interrupt IRQ vector, by using raster interrupt techniques, the screen can be split between high resolution graphics and a text window at the bottom of the screen. Before calling the INIT routine with \$14=\$102 it is necessary to set up a few locations. First, the colour information needs to be placed in location \$14 (\$14). For testing purposes my POKE(\$14,7) as described above. Secondly, the position of the screen spot needs to be set up in location \$10 (\$10 decimal). This should be in the range \$1 to \$31 corresponding to the top and

1. CLEARMAP: a fast machine code routine that clears the bit map area of memory.
2. SCREEN: a fast machine code routine that sets up the screen memory, and sets the two colour memory pointers at \$14 and \$10.
3. POINT: A routine that sets the position index of a pixel in the bit map and sets the colour word map.
4. LINE: a routine for drawing a vertical line of a certain length.
5. HLINE: a routine for drawing a horizontal line of a certain length.
6. SCREEN: Sets up the screen memory with both hi and lo colour screen text and graphics with hi.
7. INIT: an entry vector routine for the raster interrupt, vectoring the IRQ vector to the address of the SERVICE routine CLEARMAP and SCREEN.

bottom of the visible screen. A figure of \$08 (\$70) leaves a text window of about four lines. Try POKE(\$14,6).

XY coordinate plotting

According to the CBM64 programming reference guide, the address in which the character memory loc (PLY) is located is given by: $SCREEN + ROW * 128 + CHARS * 128$. POKE(\$14,MAX(\$14,0)); OR \$1 INIT where, $BASE =$ the bit map start address. By entry a \$2000 (\$10) decimal ROW = 15 (1776). The character row number (0 to 24) containing the X coordinate $LINE = (Y \text{ AND } 8)$. The character line (0 to 7) which contains the Y coord rate $CHAR = (PLY \text{ AND } 7)$. The position of the character within the row which contains the X coord rate (0 to 15).

Rearranging the equations

Obviously, the above calculations would be fairly lengthy if executed in BASIC.

Fortunately, we can rearrange the equation so that machine coding can be performed efficiently. We need to expand the equation so that, as far as possible, all multiplies and divides are exact powers of two. This simplifies all multiplication and division to simply shifting bits to the left or right respectively. The rearrangement can be performed as follows:

$ADDRESS = BASE + ROW * 128 + LINE * CHARS$
This can be expanded to:
 $ADDRESS = BASE + 40 * ROW * 8 + LINE * CHARS$
 $ADDRESS = BASE + 10 * ROW * 8 + LINE * CHARS$
By substituting the equations for ROW, LINE and CHARS and setting BASE at default \$2000 we finally arrive at:
 $ADDRESS = $2000 + 32 * AND(Y/8)*8 + 8 * AND(Y/8)*8 + (Y AND 7) * 8 * AND(7/8)$

It is now relatively easy to convert the final equation to machine code. All that $AND(Y/8)$ means is shifting Y eight times, that is dividing by eight and losing the remainder (the three least significant bits of Y).



Program Listing

10	0000	HIGH-RESOLUTION GRAPHICS	UTILITY
20	0000	WITH SPLIT SCREEN	TEXT WINDOW
30	0000	SCREEN = 0	
40	0000	YCOORD = 0	
50	0000	XCOORD = 0	
60	0000	HPAGE = 0	
70	0000	HPAGE = 0	
80	0000	LOC = 0	
90	0000	STORE = 0	
000	0000	SCREEN = 0	
100	0000	LOC = 0	
110	0000	SCREEN = 0	
120	0000	SCREEN = 0	
130	0000	SCREEN = 0	
140	0000	SCREEN = 0	
150	0000	SCREEN = 0	
160	0000	SCREEN = 0	
170	0000	SCREEN = 0	
180	0000	SCREEN = 0	
190	0000	SCREEN = 0	
200	0000	SCREEN = 0	
210	0000	SCREEN = 0	
220	0000	SCREEN = 0	
230	0000	SCREEN = 0	
240	0000	SCREEN = 0	
250	0000	SCREEN = 0	
260	0000	SCREEN = 0	
270	0000	SCREEN = 0	
280	0000	SCREEN = 0	
290	0000	SCREEN = 0	
300	0000	SCREEN = 0	
310	0000	SCREEN = 0	
320	0000	SCREEN = 0	
330	0000	SCREEN = 0	
340	0000	SCREEN = 0	
350	0000	SCREEN = 0	
360	0000	SCREEN = 0	
370	0000	SCREEN = 0	
380	0000	SCREEN = 0	
390	0000	SCREEN = 0	
400	0000	SCREEN = 0	
410	0000	SCREEN = 0	
420	0000	SCREEN = 0	
430	0000	SCREEN = 0	
440	0000	SCREEN = 0	
450	0000	SCREEN = 0	
460	0000	SCREEN = 0	
470	0000	SCREEN = 0	
480	0000	SCREEN = 0	
490	0000	SCREEN = 0	
500	0000	SCREEN = 0	
510	0000	SCREEN = 0	
520	0000	SCREEN = 0	
530	0000	SCREEN = 0	
540	0000	SCREEN = 0	
550	0000	SCREEN = 0	
560	0000	SCREEN = 0	
570	0000	SCREEN = 0	
580	0000	SCREEN = 0	
590	0000	SCREEN = 0	
600	0000	SCREEN = 0	
610	0000	SCREEN = 0	
620	0000	SCREEN = 0	
630	0000	SCREEN = 0	
640	0000	SCREEN = 0	
650	0000	SCREEN = 0	
660	0000	SCREEN = 0	
670	0000	SCREEN = 0	

Multiplying by 8 is then followed by shifting the result left three times. However, there is an even simpler way of calculating $10 \times Y/Y/8$. In effect, the above two operations simply clear the 3 least significant bits of Y. Therefore masking out the three least significant bits of Y with AND \$B0 will produce the same result. Similarly, the $10 \times X/X/8$ term can be added by ANDing the lower byte of X with \$40. Remember that the specified X, moved into the graphics mode 0 to 100. The X coordinate is stored in locations labelled XCOORD and XCOORD+1. The following code should temporarily save the one byte result in the location STORE.

STA STORE

We are even more interested in coding the term $20 \times Y/Y/8$. This simplifies even further because logically shifting Y right three times and adding it to the high byte of the result is all that is needed. However, this is only possible because the 3 least significant bits of Y are redundant. The Y coordinate is stored in the locations labelled YCOORD and YCOORD+1. The result of $20 \times Y/Y/8$ can always be stored in the location LOC+1. The low byte values are:

LOC+1
LOC+2
LOC+3
LOC+4
LOC+5
LOC+6
LOC+7
LOC+8

Now further shift right of the $20 \times Y/Y/8$ result (shifting two twice) gives $5 \times Y/Y/8$. The high byte of the former will still be present in the accumulator. The low byte is always zero. This can be coded as:

LOC+9
LOC+10
LOC+11
LOC+12
LOC+13
LOC+14
LOC+15
LOC+16

Notice that LOC is not strictly necessary in the result of the previous operation since it is always zero. However, by reserving it for future calculations...

1 and we save instructions and memory locations.

The remaining (Y AND Z) terms is easy to code, the result will be in the accumulator LDA YCOORD AND Z

If the page address of the set map base address (B3) is present in the location labeled BMAPAGE, then the final address of all the terms gives the address of the location in which the relevant bit is to be set. The corresponding code in Program 10.1 is similar but has been masked around a bit for efficiency.

Finally, in order to select the only, shall be corresponding to the required pixel we need a mask byte to OR with the address foundations. The mask can be constructed by setting the carry and rotating right the required number of times. The

map counter can be obtained from the three least significant bits of XCOORD. The following is one way to perform the

LDA XCOORD
AND # 7

TAS

SEC

LDA # 0

SHR BGR A

ORA

SHR BGR A

ORA MASK

The mask is used in the following way to set the required bit

LDY # 0

STA (LOC),Y

ORA MASK

STA (LOC),Y

Using the PLOTBIT routine

Prior to calling PLOTBIT, it is necessary to call the INIT routine with 515481532 presenter to set the screen split and colour locations first and set up the following locations with legal values. The bracketed terms are the decimal equivalents for PEEK statements from BASIC. The X coordinate must be in the range 0 to 799

These are
X coordinate low byte,
location \$B (C1),

X coordinate high byte,
location \$C (C2)

Y coordinate low byte \$D (C3),

Y coordinate high byte \$E (C4).

```

480 D0A4 44
490 D0A7 44
700 D0A0 44
710 D0A9 0000
720 D0AB 44
730 D0AC 4400
740 D0AE 44
750 D0AF 4400
760 D071 4000
770 D073 0000
780 D075 4070
790 D077 2007
800 D079 4054
810 D07B 0000
820 D07D 0000
830 D07F 4000
840 D081 407C
850 D083 40FF
860 D085 0000
870 D087 4000
880 D089 0104
890 D08B 0000
900 D08D 7124
910 D08F 40
920 D090
930 D092 40FF
940 D094 0000
950 D096 4000
960 D098 0000
970 D09A 0007
980 D09C 4000
990 D09E 710C
1000 D09F 00
1010 D0A1 0000
1020 D0A3 0000
1030 D0A5 00
1040 D0A7 0074
1050 D0A9 4000
1060 D0AB 710C
1070 D0AD 00
1080 D0AF 0000
1090 D0B1 0000
10A0 D0B3 0000
10B0 D0B5 710C
10C0 D0B7 00
10D0 D0B9 0070
10E0 D0BB 0000
10F0 D0BD 0000
1100 D0BF 0000
1110 D0C1 4000
1120 D0C3 0000
1130 D0C5 400000
1140 D0C7 0000
1150 D0C9 0000
1160 D0CB 4000
1170 D0CD 4000
1180 D0CF 710C
1190 D0D1 00
1200 D0D3 0070
1210 D0D5 0000
1220 D0D7 00
1230 D0D9 4007
1240 D0DB 710C
1250 D0DD 00
1260 D0DE 0070
1270 D0DF 40
1280 D0E1
1290 D0E3 204000 710C
1300 D0E5 4070
1310 D0E7 0000
1320 D0E9
1330 D0EB
1340 D0ED

```

```

LBR #
LBR #
LBR #
STA LOC+1
LBR #
ROR LOC
LBR #
ROR LOC
ADC LOC+1
STA LOC+1
LDA YCOORD
AND #7
ADC LOC
ADC STORE
STA LOC
LDA LOC+1
ADC STORE+1
ADC BMAPAGE
STA LOC+1
LDY #0
LDA (LOC),Y
ORA MASK
STA (LOC),Y
RTS

I
CLEANUP
RTS
BMAPAGE
BGR STORE+1
LDA #0
STA STORE
LDA BGR
LDY #0
STA STORE+1
LDY #0
STA STORE+1,Y
RTS
DEC LOC+1
INC STORE+1
DEC
BGR LOC
LDY BGR
STA STORE+1,Y
RTS
BGR LOC+1
RTS

I
BGR FILL
LDA #0
STA STORE
LDA BGR+1
STA STORE+1
LDA BGR+1
LDA BGR+1
LDY #0
LDY #0
STA STORE+1,Y
DEC
BGR CYCLE
INC STORE+1
DEC
BGR BLOCK
STA STORE+1,Y
LDY BGR
BGR NEXT
RTS

I
FOR PLOTBIT
INC YCOORD
INC LBR+1
BGR VLTN

```


Program Listing (cont.)

```

1350 D000 RTN
1360 D000 I
1370 D000 SC4800 HLIN
1380 D000 SC48 RTN
1390 D000 SC00
1400 D000 SC4C
1410 D000 SC SCIP
1420 D000 SC00C
1430 D000 SC00
1440 D000 SC00C
1450 D000 SC00
1460 D000 SC00C
1470 D000 SC00C SCIP
1480 D000 SC00
1490 D000 SC00C
1500 D000 SC00
1510 D000 SC
1520 D000 I
1530 D000 SC0000 SERVICE
1540 D000 SC00
1550 D000 SC00
1560 D000 SC0000
1570 D000 SC0000
1580 D000 SC00
1590 D000 SC00
1600 D000 SC0000 TEXT
1610 D000 SC00 SCIP
1620 D000 SC0000
1630 D000 SC0000
1640 D000 SC00 SCIP
1650 D000 SC0000
1660 D000 SC00
1670 D000 SC0000
1680 D000 SC00
1690 D000 SC0000 HIRL
1700 D000 SC00 SCIP
1710 D000 SC0000
1720 D000 SC0000
1730 D000 SC00
1740 D000 SC0000
1750 D000 SC00
1760 D000 SC0000
1770 D000 SC0000 SCIP
1780 D000 SC00 SCIP
1790 D000 SC00
1800 D000 SC00
1810 D000 SC
1820 D000 SC00
1830 D000 SC0000
1840 D000 SC00
1850 D000 SC0000
1860 D000 SC0000
1870 D000 SC00
1880 D000 SC0000
1890 D000 SC0000
1900 D000 SC00 SCIP
1910 D000 SC0000
1920 D000 SC00
1930 D000 SC00 SCIP
1940 D000 SC
1950 D000 SC00 SCIP
1960 D000 SC
1970 D000 SC
1980 D000 SC
1990 D000 SC
2000 D000 SC
2010 D000 SC

```

Once this has been done a WARMUP call will light up the pool at the chosen screen coordinate.

The VLIN routine

This is a very simple routine that draws a vertical line on the high resolution screen by incrementing the location SC004D prior to calling the SC0000 subroutine. Before calling set up the following locations with legal values:

- Start X coordinate low byte location SC0 (25)
- Start X coordinate high byte location SC1 (25)
- Start Y coordinate location SC2 (25)

Length of vertical line in range 1 to 300 (within SC20) (max)

The VLIN routine can be called from BASIC with WARMUP.

The HLIN routine

This is similar to above but draws a horizontal line by incrementing the X-coordinate value prior to calling the SC0000 subroutine. The routine is slightly more complex because two bytes each are used for the lengthy operation and X-coordinate value. Remember that the width of the screen is 300 pixels. Before calling from BASIC with WARMUP, set up the following locations with legal values:

- Start X coordinate low byte location SC0 (25)
- Start X coordinate high byte location SC1 (25)
- Start Y coordinate, high byte location SC2 (25)
- Start Y coordinate location SC3 (25)

Length of horizontal line, low byte location SC00 (max)

Length of horizontal line, high byte location SC00 (max)

The raster Interrupt SERVICE routine.

This is a fairly complex piece of programming to explain so it has to be in detail in the program READDOWN section. The INTERRUPT routine is called each time a raster interrupt occurs this will be at the top of the screen for graphics and yes, two-thirds of the way down the screen for text.

Program breakdown

Lines 10 to 150	Assign labelled locations for administrative and data of program.	
Lines 150	Launch assembly at location 4000 (PUSH) jumps.	
Lines 180 to 250	Form a jump table which calls the chosen routine and returns either to the machine code program that called it or back to BASIC. This practice can save considerable time when modifications are made, since the routines would all have the same apparent calling addresses. Where possible, always use labels, and force the assembler to do the tedious work.	Lines 150 to 1500
Lines 250	Disable interrupts while vectors are changed.	
Lines 280 to 290	Clear the screen.	
Lines 290 to 310	Set the labelled location BAYPAGE to 520 which contains the delta of base page address of the bit map.	
Lines 340	Call the screen memory fill routine SCORILL.	
Lines 350 to 360	Set bit zero of Control Register A (CRA) of the CIA. This effect stops the normal key board scan interrupt every 1/60th of a second.	
Lines 360 to 420	Redirect the interrupt IRQ vector to the MIOKIO routine.	
Lines 430 to 470	Set the raster interrupt to occur at the position specified in the location labelled SPUT by writing to the raster register.	
Lines 480 to 500	Draw the most significant bit from the raster count.	
Lines 510	Re-enable interrupts to occur.	
Lines 540 to 560	Clear the location IOC and produce the mask for setting the CIA's coordinate bit.	
Lines 640 to 660	Calculate X coordinate address (IOC) IOC+1 (2 bytes) (See earlier text for details).	
Lines 680 to 690	Inserting YCOORD and YCOORD into the base address of the bit map as set in the location BAYPAGE.	
Lines 690	Set the X register, the page counter, to 128 (this is set to the nearest whole number of pages (256 byte blocks) to fit cleared on the bit map).	
Lines 690 to 7000	Form a loop which clear 512 pages of memory, a page at a time, using indirect indexed addressing.	
Lines 7050 to 7080	Form a loop which clears the odd 512 bytes of the bit map remaining.	
Lines 7110	Seed the accumulator with the combination of colour setup in the location labelled SCOROB. This can be POK'd in from BASIC as expected earlier.	
Lines 7360 to 7380	Load upstream memory locations in a similar loop structure with which the bit map was cleared.	
Lines 7390 to 7440	Call the routine PLOTBIT a fixed number of times within a loop to draw a vertical line. Each time round the loop the Y record runs, YCOORD, is incremented and the angle decremented. The loop ends when Y+GTH has reached zero. Single byte values are used each time because the maximum number of vertical post points is 255. Similarly calls the routine PLOTBIT a fixed number of times. Horizontal lines are drawn by incrementing SCOROB (2 bytes) and decrementing Y+GTH (2 bytes). The loop is a double byte loop because the length and X coordinate values can be greater than 255.	
Lines 7450 to 7510	Check if bit zero of the interrupt raster register is set. If it is found to be clear a branch to the location labelled EOT occurs.	
Lines 7580	Clear bit zero of the interrupt raster register flag. This is the raster interrupt flag.	
Lines 7570 to 7580	Check if the raster count is at high resolution limit of screen when interrupt occurred. If to branch to location HIRIS.	
Lines 7660 to 7670	Set the next interrupt to occur at an invisible region at the top of the screen and above the displayed area.	
Lines 7680	Force a branch to EOT at all times. Raster branch instructions are always more favoured than absolute (JMP) instructions because the object code is inherently relocatable.	
Lines 7740 to 7750	Set the next interrupt to occur at the position specified in the location labelled SPUT.	
Lines 7770	Call the normal routine SCORBY. This is necessary because the normal keyboard scan has been disabled earlier.	
Lines 7780 to 7800	Check if a key has been pressed. If it has been, the program branches to the location G410.	
Lines 7810	Disable interrupts while interrupt vector are changed.	
Lines 7830 to 7850	Reset the default interrupt vector for normal interrupt operation. The normal Commodore interrupt handling routines are at location SCACH.	
Lines 7860 to 7880	Clear bit zero of control register A of the CIA, thus restoring the normal 1/60th second keyboard scan interrupt.	
Lines 7880 to 7910	Disable further raster interrupts by clearing bit zero of the interrupt raster register.	
Lines 7920 to 7930	Clear the screen.	
Lines 7940	Enable normal interrupts.	
Lines 7950	Form a branch always to location EOT. This ensures that an termination of split screen interrupt, standard text mode is selected.	
Lines 7960 to 2810	Roll registers from the stack to the same order that the normal Commodore interrupt service routine would and return from interrupt.	

Program 11.1:

```

10 REM MACHINE CODE HEX LOADER
20 M=49152:CH=46000:G=0:PRINT CHR$(147)
30 PRINT"LOADING MACHINE CODE BYTES:PLEASE WAIT"
40 FOR P=0 TO 365:READ D#
50 FDX=ASC(D#)-48
60 SDX=ASC(RIGHT$(D#,1))-48
70 IF FDX>9 THEN FDX=FDX-7
80 IF SDX>9 THEN SDX=SDX-7
90 B7X=16*FDX+SDX
100 G=G+B7X
110 POKE M+P,B7X
120 NEXT
130 IF S=CH THEN PRINT"ERROR,CHECKSUM"
140 IF S=CH THEN PRINT"CODE LOADED OK"
150 END
160 REM *
170 REM **
180 REM MACHINE CODE DATA
190 DATA 20,10,C0,60,20,4C,C0,60
200 DATA 20,31,C0,60,20,3C,C0,60
210 DATA 78,A9,93,20,33,FF,A9,20
220 DATA 85,FF,A9,04,80,00,C3,20
230 DATA 90,C0,30,A6,C0,A6,0E,3C
240 DATA 39,FE,80,0E,3C,A9,FE,80
250 DATA 14,63,A9,C0,80,15,03,AD
260 DATA 1A,30,09,01,80,1A,80,AD
270 DATA 02,80,12,D0,A6,11,80,39
280 DATA 7F,8D,11,80,38,60,A5,FB
290 DATA 29,07,AA,38,A9,00,85,3A
300 DATA 6A,C6,10,FC,8D,59,A3,FB
310 DATA 29,FB,85,3C,A3,FB,4A,4A
320 DATA 4A,85,58,4A,4A,5A,4A,4A
330 DATA 5A,63,58,83,58,A3,FB,39
340 DATA 07,63,5A,63,5C,85,5A,A5
350 DATA 58,65,FC,63,FF,85,58,60
360 DATA 00,81,5A,C8,59,91,5A,60
370 DATA A8,FF,85,5D,A9,00,05,3C
380 DATA A2,1F,A0,00,91,5C,88,D0
390 DATA FB,88,5D,CA,00,F4,A0,3F
400 DATA 91,3C,88,10,FB,60,A9,00
410 DATA 85,3C,AD,00,C2,85,58,A5
420 DATA FE,A2,03,AD,00,91,3C,88
430 DATA D0,FB,6A,5B,CA,80,F4,91
440 DATA 5C,A0,E7,91,5C,88,D0,FB
450 DATA 60,30,4E,C0,88,FD,CE,01
460 DATA C3,D0,F4,60,20,4E,C0,88
470 DATA FB,D0,02,88,FC,38,AD,01
480 DATA C2,E7,01,8D,01,C2,D0,03
490 DATA CE,02,C2,AD,01,C2,D0,64
500 DATA AD,02,C2,D0,DF,60,AD,19
510 DATA D0,29,01,F0,3A,80,19,90
520 DATA AD,12,D0,C9,18,90,17,AD
530 DATA 18,D0,29,F7,8D,18,D0,AD
540 DATA 11,D0,29,0F,8D,11,D0,A9
550 DATA C0,8D,12,D0,F0,15,AD,18
560 DATA D0,07,08,8D,18,D0,AD,11
570 DATA D0,09,30,8D,11,80,A5,02
580 DATA 8D,12,D0,20,FF,F0,20,84
590 DATA FF,C9,60,F0,23,78,A9,31
600 DATA 8D,14,03,A9,EA,8D,15,03
610 DATA AD,0E,3C,09,01,8D,0E,3C
620 DATA AD,1A,D0,29,FE,8D,1A,D0
630 DATA A9,73,20,02,FF,38,D0,A7
640 DATA A8,AD,60,AA,68,40

```

examples of discontinuous curves and will need to relay at certain points, how computers, as you probably know, are not at all of infinite mathematics. There is an upper and lower limit to the magnitude of a number that a computer can handle without spitting out an error message of some kind. This means that a function plotter must first ask the operator whether the function is continuous or discontinuous. If the operator tells the computer it is continuous, then the Y plot is scaled automatically and it is only necessary to enter the range of X values over which the equation is to be plotted. On the other hand, if the function is discontinuous, then it will be necessary for the operator to give the Y value range as well as the X value range.

The plotting density, which is another way of stating the resolution, can be defined by the operator on a scale of 1 to 4. Plotting density 1 gives the lowest

resolution (small number of plotting points) and plotting density 4 the highest plotting density and therefore the closest to a continuous curve.

There are no error trapping facilities in BASIC so to protect the program from break out of incorrect equations, we entered it a also possible for a break out to occur if the calculations average division by zero. If this happens, by the program again without financial penalty or perhaps with a different plotting density. This may avoid the region where the division by zero is occurring.

Using the program

To obtain initial familiarity with the program, an example equation is a cross-programmed one line 1000 to, in the first instance, the procedure is:

1. Enter RUN and press RETURN. After some explanatory messages, the program comes to a halt.

2. Enter SLO, X00 and press RETURN. The next screen is asked to supply the following information:

"ENTER X AXIS (MIN)". Try 0
 "ENTER X AXIS (MAX)". Try 6.28
 (which is approximately 2 π), so to serve the will produce a graph of one or even nearly one complete cycle.
 "ENTER PLOTTING DENSITY (1-4)". Suggest you reply with 1, the lowest density but best to execute.
 "AUTO Y AXIS LIMITING (Y/N)". This is really asking if the curve is continuous and therefore suitable for automatic scaling of the Y axis. The best to answer is a ordered continuous because it is the sin X function and so you will enter Y.

Assuming everything is OK with your program and the machine code (not mentioned earlier) are already resident in RAM, the program should begin to show the typical sinusoidal graph of the function extending over one cycle,


```

10 REM HI-RESOLUTION FUNCTION PLOTTER
20 REM (USING MACHINE CODE SUBROUTINES)
30 PRINT CHR$(147);PRINT TAB(14);"GRAPH PLOT";PRINT;PRINT
88 PRINT"PROVISION OF Y AXIS LIMITS ARE NEEDED"
90 PRINT"FOR NON CONTINUOUS GRAPHS ONLY"
60 PRINT;PRINT"ENTER FUNCTION IN LINE 1000 SUCH AS";PRINT
80 PRINT"1000 DEF FN EQ(X)=SIN(X)";PRINT
100 PRINT"ENTER FUNCTION THEN TYPE 'RUN1000'"
110 END
997 REM *
998 REM **
999 REM START OF PROGRAM PROPER
1000 DEF FN EQ(X)=SIN(X)
1005 DIM Y(322);M=319;H=159;PRINT CHR$(147)
1010 DEF FN HI(X)=INT(X/256)
1020 DEF FN LO(X)=X-(FN HI(X)*256)
1022 DEF FN XC(X)=INT(M*(X-XL)/(XR-XL))
1024 DEF FN YC(Y)=INT(H*(YT-Y)/(YT-YB))
1030 INPUT"ENTER X AXIS (MIN)";XL
1040 INPUT"ENTER X AXIS (MAX)";XR
1050 IF XL>XR OR XL>0 OR XR<0 THEN PRINT"INPUT REJECTED";GOTO 1030
1060 INPUT"ENTER PLOTTING DENSITY (1-4)";AL
1070 IF AL<1 OR AL>4 THEN 1060
1080 AL=AL+50;INC=(XR-XL)/AL
1090 YT=0;YB=0
1100 INPUT"AUTO Y AXIS LIMITS (Y/N)";KB
1120 IF KB="Y" THEN 1180
1130 IF KB="N" THEN 1150
1140 GOTO 1100
1150 INPUT"ENTER Y AXIS (MIN)";YB
1160 INPUT"ENTER Y AXIS (MAX)";YT
1170 IF YB>YT OR YB>0 OR YT<0 THEN PRINT"INPUT REJECTED";GOTO 1150
1180 GOSUB8000
1190 POKE254,7;POKE2,216;SYS49152;REM INIT
8800: BEEP80000
8810: BEEP810000
1220 FOR N=1 TO 21:PRINT;NEXT
1230 PRINT"LARGE X AXIS DIVISIONS= "IX
1240 PRINT"LARGE Y AXIS DIVISIONS= "IY;
1250 GOSUB7000
1260 END
3997 REM *
3998 REM **
3999 REM CALL V.LIN ROUTINE
4000 IF IX<0 OR IX>M OR YB<0 OR YB>H THEN 4060
4010 POKE255,FN LO(XI)
4020 POKE252,FN HI(XI)
4030 POKE253,YI
4040 POKE49645,LX
4050 SYS49160
4060 RETURN
4997 REM *
4998 REM **
4999 REM CALL H.LIN ROUTINE
5000 IF IX<0 OR IX>M OR YB<0 OR YB>H THEN 5070

```


Program 11.2 (cont.)

```

5010 POKE251,FM LD(X)
5020 POKE252,FM HT(10)
5030 POKE253,Y
5040 POKE49665,FM LD(X)
5050 POKE49666,FM HI(X)
5060 SYS49164
5070 RETURN
5997 REM =
5998 REM ==
5999 REM CALL PLOTBIT ROUTINE
6000 IF X<0 OR X>M OR Y<0 OR Y>N THEN 6050
6010 POKE251,FM LD(X)
6020 POKE253,FM HI(X)
6030 POKE253,Y
6040 SYS49164
6050 RETURN
6997 REM =
6998 REM ==
6999 REM PLOT GRAPH SUBROUTINE
7000 N=0
7010 FOR X=XL TO XR+INC/10 STEP INC
7020 N=N+1
7030 X=FM XC(X)
7040 Y=FM YC(Y(N))
7050 GOSUB4000
7060 NEXT
7070 RETURN
7997 REM =
7998 REM ==
7999 REM TABULATION SUBROUTINE
8000 PRINT CHR$(147);PRINT"TABULATING"
8010 N=0:FOR X=XL TO XR STEP INC:N=N+1
8020 Y(N)=FM EQ(X)
8030 IF K8="M" THEN 8060
8040 IF Y(Y(N)) THEN Y=Y(N)
8050 IF YB>Y(N) THEN YB=Y(N)
8060 NEXT
8070 RETURN
8997 REM =
8998 REM ==
8999 REM DRAW AXIS SUBROUTINE
9000 X=FM XC(0)
9010 YZ=0:LX=H+1:GOSUB4000
9020 YZ=FM YC(0)
9030 XZ=0:LX=H+1:GOSUB5000
9040 RETURN
9997 REM =
9998 REM ==
9999 REM DRAW AXIS DIVISIONS SUBROUTINE
10000 K=XR:IF ABS(XL) > ABS(XR) THEN K=XL
10010 GOSUB10000:X=H
10020 FOR I=P TO XR+H/10 STEP H
10030 XZ=FM XC(X):YZ=FM YC(I)
10040 LX=0:IF YZ=10 THEN YZ=Y-XL:11
10045 IF YZ=H-10 THEN LX=XZ/2

```

together with calibration pages on the X and Y axis. You can then try out the program again with perhaps different X limits and perhaps a higher plotting density. For example, try the effect of $X \text{ (MM)} = -4.28$ and $X \text{ (MM)} = 12.3$ and a plotting density of 4. This should show almost three complete cycles of a sine wave.

Using your own equations

Once you have gained familiarity with the program you will naturally want to enter your own equations instead of making use of the defaults. The instructions to do this are presented on the screen during the initial run but it is worth giving an example. Suppose you want to graph the equation, $Y = (X - 4)^2$. The line you must enter, when the first part of the program has come to a halt, would be

9000 GYF FM EQ (X-P+4)^2

This, of course, will now replace the original line 9000. You must then enter XL= 9000 before the program will continue. The rest is up to you.

If the equation you want happens to be discontinuous, then your reply to the query "AL TO H ASK L YS BING (N)?" must be N. You will then be asked to enter your own X limits. Instead of relying on automatic scaling, if you have no cross edge whatsoever of the helix use of the keyboard, then this will be very much a trial and error process which must continue until the Y limits are deemed acceptable.

Those who, in the past, have spent hours plotting equations on graph paper with paper and pencil and who are well acquainted with the use of the program, an equation like $Y = 21.4 X + 187.000$ would be drawn in seconds by the computer, how long would it take you without one?

How the program works

Drawing some sort of graph on the screen is relatively easy. The trouble arises when you have to tailor the graph to make the use of the available screen area and, more importantly, to avoid overstepping the boundaries. This means that all actual X values and corresponding Y values can not be used in their raw form. This means that:

- The maximum and maximum Y values must first be found
- The calculations must then be scaled to fit into the screen area but without wasting any space
- The scaled values must then be translated into the appropriate screen coordinates

As you will appreciate, the entire project is far from easy and as you will understand why the program may seem rather lengthy. And for completion on to the production of calibration pages on the

Program 11.3 (cont)

```

10050 GOSUB4000:NEXT
10060 FOR X=P TO XR+R/10 STEP R/4
10070 XE=FN XC(X):YE=FN YC(X)
10080 L3=3:IF Y3=10 THEN Y3=Y3-2:L3=3
10090 IF Y3=H-10 THEN L3=L3/2
10095 GOSUB4005:NEXT
10110 K=YT:IF ABS(YB)=ABS(YT) THEN K=YB
10120 GOSUB1100:YY=Y
10130 FOR Y=P TO YT+R/10 STEP R
10140 XE=FN XC(X):YE=FN YC(Y)
10150 L3=3:IF X3=10 THEN X3=X3-5:L3=11
10155 IF X3=H-10 THEN L3=L3/2
10160 GOSUB4005:NEXT
10170 FOR Y=P TO YT+R/10 STEP R/4
10180 XE=FN XC(X):YE=FN YC(Y)
10190 L3=3:IF X3=10 THEN X3=X3-2:L3=3
10195 IF X3=H-10 THEN L3=L3/2
10200 GOSUB4005:NEXT
10210 RETURN
10995 REM *
10996 REM **
10999 REM FIND GRADUATION INCREMENT
11000 END
11010 *****
11020 IF K<1 THEN K=K*10:D=C-1
11030 IF K=10 THEN K=K/10:D=C+1
11040 IF K<1 OR K=10 THEN 11020
11050 K=-INT(K+1)
11060 P=K*10*D
11070 R=1*10*D
11080 RETURN

```

screens. The program has been arranged so that the page represents integral powers of ten. This does make it easy to read off the values. A test is taken, of about four lines, at the foot of the screen to employ to display the values of these area graduation increments. Smaller screen arrangements are used to display and match between the high resolution screen and the text screen.

The program has been written, as far as possible, in tight, self contained, subroutines. The rest of the program begins at line 1000 with a batch of five user-defined functions followed by the set of keyboard prompt messages. This is a fairly straight forward asking for X and Y value lines, plotting devices etc.

Calling the Machine Code INT routines

Line 1100 calls an extensive machine code routine called INT. This machine code sub-routine sets up the frame settings, clears screen memory and the BC bit map area. Two parameters need to

be passed before calling the INT routine.

1. The two colours allowable in the standard high resolution mode need to be POKed into location \$H (\$H decimal). The upper nibble (4 bits) or half a byte is set to zero (black), and the lower nibble a set to 7 (yellow). Therefore POKing Ten into location \$H equates a black graph on a yellow background.

2. The position of the screen split between graphics and text needs to be POKed into location \$D (\$D POKing 24 into location 2 produces a text window of about four lines at the bottom of the screen).

The subroutines

CALL VIEW BOX PLOT (COSUB 4000)

Draws a vertical line of length, L%, starting at the screen coordinates specified by X% and Y%. The purpose of using the DIFFER function FN L(X%,Y%, and FN H1 (3%) is to split the X screen coordinate X%, which may exceed 255, into two-byte lines for direct POKing into locations \$18 (\$18) and \$1C (\$1C). The

length parameter, L%, must be POKed into location \$C20 (\$C20)

Y% should be within the range 1 to 255

X% should be within the range 0 to 255

Once the parameters have been POKed the machine code sub-routine is called from BASIC with SYS 49500

CALL RUN ROUTINE (COSUB 3000)

This sets up the parameters and calls a machine code routine for drawing a horizontal line. Parameters are identical to above except of course that X% can be as large as 255. Therefore the functions FN XOP(X%) and FN HOP(X%) are needed to POK the necessary bytes into \$C00 (\$C00) and \$C01 (\$C01)

CALL PLOTING ROUTINE (COSUB 4000)

Plots up a point at the provided screen coordinates by calling on a machine code sub-routine from BASIC with SYS 49500. The parameters that need to be POKed prior to calling are the X coordinate X% and the Y coordinate Y%. The X coordinate value must be split into low byte and high byte from as above. The Y coordinate value Y% is always less than 255 so can be POKed directly. The machine code sub-routine itself is called from BASIC with SYS 49510.

PLOT EXAMP (COSUB 3000)

Plots the actual graph with the aid of FN XC and FN YC. These scaling functions translate the actual values of X and Y to a scaled value with in the available screen area. The sub-routine frequently employs the CALL PLOTING SUBROUTINE to light up individual points corresponding to the graph.

TABULATION (COSUB 4000)

This sub-routine is responsible for finding the maximum and minimum value of the function and also calculating all Y values corresponding to the X values. The calculated results are then held in the array Y (Y%), ready for use in plotting the graph. If the function, as determined by the operator to be discontinuous, (overwrote FN) the query material (Y values from 0000 and 0000 are not displayed)

GRAPH AXES (COSUB 4000)

Draws the X and Y axes of the graph

GRAPH AXES DIMENSIONS (COSUB 10000)

Draws and positions the calibration pipe which are to appear on the axes. Each large graduation interval, corresponding to an integer power of ten, is further divided into 3 small graduations to more accurate readings of the graph

FIND GRADUATION INCREMENT (COSUB 11000)

This sub-routine calculates the range and integer powers of ten increment for the graduation pipe positioning and is used in conjunction with the previous sub-routine.

The full assembler listing and compiled listings of all the machine code sub-routines are in the MACHINE CODE article in this issue of YOUR COMMODORE.

Renegade discovers that adventures don't really need text with two games that set new standards for adventure programs.

NINE MONTHS BACK WE LOOKED AT that incredible, intricate adventure tapestry *Wishbraker*, fantastic graphics and so far been proved by its sales, a winner all the way. In between guiding the hero around the screen in all sorts of athletic maneuvers, various operations are performed by moving a cursor over a selection of small pictures, or icons, to issue input commands to the computer.

This use of icons is very fascinating, in the "point-and-click" variety. Business games using this technique in writing to make programs ultra-mercenary and foolproof to test those above their own speed of use is certainly desirable, as it is often quicker to type **GO DOWN PROGRAM** than to manipulate a cursor over the appropriate icon and initiate the command.

Meanwhile, most adventur programs have made no effort to making input commands limited to only those that may be understood and acted upon. They often employ good graphic effects, especially hero-falls, endings, bonus pictures and so on, such as in Beyond Software's *Shadowfire*.

Shadowfire

The production banner below that there are 162 different icons to toggle the fast flow of rough-hewn, high-speed adventure. The screen presentation is a good one, although even though the speed of operation is so great, perhaps not as fast as one has been led to expect. It is difficult to see how the independent handling of so different characters could be improved upon by any other system.

The basic screen is divided around the kidnapping of one Ambassador Joyce, who is held in a top-down, head-down, embedded in his torso, he must be moved quickly and in any case.

Super-Buddy General 201, who, upon capture showed his personal "super-talent" behind an extended fork, who can usually penetrate such a heavily defended position and successfully complete the mission in such a short time.

Enter, *Caligula*, a terrific intelligent organization with its operations a chaotic mixture of super, sub, and super and indicated super person together with barely concealed "super" elements and the latest in cybernetic android.



You have control over almost every step of walking down stairs. You have one hour and forty minutes in which to locate and free the prisoner, capture General 201 and destroy his laboratory. Use the time wisely, you will need every minute.

Control may be taken from the keyboard, analog or digital joystick, the normal joystick is digital or even by the use of a light-pen. Reading the opening manual is a must; you may be confused at first, it has to tell you if the

screen, each team member just specialized training in various areas. So before you start writing them, don't be making mistakes. And the manual. Only you can carry and operate the possible transporter, because. Only you can correctly pick the logic to be based on the enemy code.

How may only your orders to give you a list of times to an ordered person? On taking the manual to hand, the display graphical interface presents a person's action strength, agility, number and the weight they are carrying.

The display also depicts graphically the present status of all the team members, whether they can "breathe" (moving, moving, drinking, using, using, using a "base screen" gives you a plan of the battlefield, an area, the chosen character, including character number and score, points of action, and so on.

Usually a box in the bottom right of the screen shows the icons for further commands; they may place the Object Movement or Battle screen, or you may quit leaving commands on the screen.

Choose the Object screen and you will again be presented with a series of icons. Those in the bar to the right show you to manipulate the object screen, the other two bars. Those in the left, and what is visible at the bottom and above the center are what that character is already carrying. The control system, picking, and dropping, activation and making to use. There often enable you to display the other screen, scores, and so on.

The Movement screen displays eight icons indicating the possible directions of movement, although not all eight directions may be permitted.

The Battle screen shows the choice of attack, defend, retreat or just observe. In any of eight directions, making your choice, and the possible directions of attack are displayed in a box on the right.

As you may have gathered, running your



first read but to start your mission, you will also see a team. Each goal can be assigned, over the General 201, who is the main character. Without reading the manual this may take you some time to organize


```

5 REM####ADVENTURE MAP####
6 REM####BY M.D. CLARK####
10 POKER=255:G=0:POKE 53281,0:PRINT TAB
20 GOSUB 250
40 PRINT:IF P=1:PRINT FIRST:OTHER WAYS:IF G=0:PRINT A COPY:
50 POKE 198,0:WAIT 1198
60 GOSUB 250:PRINT:PLEASE WAIT:
70 OPEN #1:
80 PRINT#4:ADVENTURE TITLE:
90 PRINT#4:
100 FOR M=1 TO 24
110 FOR T=1 TO 16
120 PRINT#4:
130 ##
140 FOR D=1 TO 16
150 PRINT#4:
160 NEXT D
170 PRINT#4:
180 ##
190 CLOSE #4
200 GOSUB 250:PRINT:ANOTHER COPY:
210 PRINT:PRESS Y OR N:
220 GET:IF #1 THEN GOTO 40
230 IF #1 THEN PRINT:END
240 GOTO 20
250 PRINT:ADVENTURE MAP GENERATED:RETURN

```

Adventure MAP Generator

Variables used:

- 10 Loop for number of squares down
- 16 Loop for top half of square
- 26 Loop for bottom half of square

Line explanation:

- 10 Set Border, Background and first square
- 40 Print warning on screen
- 50 wait for key press before printing
- 60 clear screen and ask user to wait
- 70 open channel to printer
- 80 print heading at top of page with space for name of adventure and date
- 90 print blank line
- 100-130 sets loop for number of squares down
- 140-160 loop for top half of square
- 170-190 print top half of square (graphics are 16x16 Commodore style)
- 200-240 loop for bottom half of square
- 250 print bottom half of square (graphics are 16x16 Commodore style)
- 260 print 2 blank lines
- 270 sets loop for number of squares down
- 280 clear channel to printer
- 290 ask another copy Y or N
- 300-320 print program exit

Mapping an adventure

We have now generated our program before being in the world of Adventure but there is always more to be made before we can really have a first look at Adventure Map Generator for the Commodore 64.

The first test level is a simple one, the necessity to map your world with Adventure's square grid. Adventure's square grid is 16x16 squares. Adventure's Printer, just installed for the Commodore 64, will enable those of you who wish to print your map.

The program will work on a Commodore 64 or equivalent printer as well as a Commodore 64 printer. The printer will print 16x16 squares on a 16x16 grid. The printer will print 16x16 squares and the printer will print 16x16 squares. The printer will print 16x16 squares and the printer will print 16x16 squares.

The reduction of the number of squares on the page is a 16x16 grid. The printer will print 16x16 squares and the printer will print 16x16 squares. The printer will print 16x16 squares and the printer will print 16x16 squares.

RELIABLE ROUTINES

Mike Hart rectifies some of the faults of Commodore Basic with handy REPEAT and DO loops.

IT IS WELL-KNOWN BY NOW THAT THE version of BASIC contained in the C64 and the VIC-2, need to put it politely, deriving from the version of BASIC found in the PETs. The most obvious shortcomings are the absence of control loops such as DO...WHILE or REPEAT...UNTIL which are found in more recent (and better structured) BASICs such as version Plus on the C128.

However it is possible to simulate lack of these features by using COMBASIC's particular ways. I shall present here two ways of adding REPEAT...UNTIL loops, the first being in BASIC itself whilst the second is a machine-code routine.

REPEAT...UNTIL in BASIC

To implement REPEAT...UNTIL in BASIC we can utilise FOR...NEXT loops as our basic building blocks. In the traditional FOR...NEXT loop we are using the loop counter to specify the number of times that we wish to have an operation performed. The trick is to make the FOR...NEXT loop an endless loop (ie repeat itself) when a condition is achieved, logically false but have the loop end when the condition under test is true, so there are two processes involved here - let us consider both in turn.

Firstly, how do we make the loop endlessly repeat itself? The answer lies in knowing how the loop operates in the first place: the loop will always be performed at least once. When NEXT is encountered the step increment will be added to the loop variable, the new loop value is now checked against the specified upper limit and if it is less (or with a negative step greater) than the loop is incremented. If we specify a STEP value of 0 then obviously the upper limit will never be exceeded and the loop will repeat indefinitely. To check this out the reader can see that the following loop will never end until the RUN-STOP key is pressed: FOR I = 10 TO 1 STEP 0, NEXT I.

The next stage in the process is to test

logical operators to determine the truth of an expression. If an expression is "true" then a value of 1 will be produced for it, the expression:

A = 10 : B = (A = 8) : PRINT B

It will always take a value of 0. If we want to change the expression to B = (A = 10) we now find that B is true and has a value of 1. To make our REPEAT...UNTIL loop all we have to do is make an endless loop which repeats indefinitely when the condition is false (ie, 0) but which ends when the condition is true (ie, 1).

We achieve this in the following way. I am assuming that we wish to display and

print out a number until such time as the number exceeds 1000:

```
10 A = 1
20 FOR J = 0 TO -1 STEP 0
30 A = 2 * A : PRINT A
40 J = (A > 1000) : NEXT J
5000 A is less than 1000 now J will be
like 1 ie, 0. When incremented by a STEP
of 0 it remains 0. This suggests that -1 and
so the loop continues. When A = 1004, it is
"true" that A > 1000 and so J is made to 1
This is represented still by 0 but -0 is not
greater than 0 so the end-first and so the loop
ends.
```

Program Listing

```

B*
      FC BR AC DR VR SP
      10000 30 4F 4F 00 F6
      .
02A7 8C 3C 03      STP 00000
02A8 AE 02      LDH 0002
02AC 80 A7 02      LDH 000A7,X
02AF 05 73      STA 073,X
02B1 0A      DCH
02B3 10 F6      BPL 000AC
02B4 00 02      STH 0002
02B6 00      STB
02B7 A0 02      LDH 0002
02B9 80 A2 E3      LDH 000A2,X
02BC 05 73      STA 073,X
02BE CA      RES
02BF 10 F6      BPL 000B3
02C1 00      STB
02C2 00 0A      LHD 07A
02C4 00 02      BNE 000CB
02C6 00 F6      LHD 076
02C8 A0 00      LDY 0000
02CA 01 7A      LDH 007A,Y
02CC 00      STB

```



25 IF A > 1000 THEN J = -1, GOTO 40
As you can see, the processing section of the loop is completely bypassed if initially A is set to a value greater than the upper limit.

to go to an implementation of REPEAT built in machine code in a form which works on both the VBC and the C-64. By allowing CHRG to look for the character, the routine scans for a R (for REPEAT) or a L (for LIFT), as required, just a few points need to be made about the implementation. Firstly, it is now the programmer's responsibility to make sure that the looping variable is correctly initialised - one line tall, secondly, notice that nested REPEAT-UNTILs are possible - in fact a secondary scan is initiated to allow for nesting up to 32 levels.

To minimize relocation difficulty, we'll load it up into two buffers, the low half of which occupies \$0007-000C where it should be kept! The second half of the routine can go anywhere that is protected although I have put it in the cassette buffer. The second half of the routine loads all into the low half of the register both as integers and uses the CHSRCT routine (which looks far and processes BASIC character sets at a time) and also builds up a stack of low-addresses and pointers. This is to ensure that when a BL instruction the integer "frames" where to return to find across the low registers (cassette buffers MB and MI) thus it contains the low and high bytes of the start location of the run routine if Cld owners wished to get the run routine onto \$0080 then they could save 16 or use 14 space to 40957 and leave 20-71 would you are that the correct low address-higher was used (see note source).

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Line	Byte	From	To
51	4	162	170
54	7	444.1	453.4
61	6	162	170
61	7	173	200
51	8	168	201
67	6	162	170
67	7	11 500	11 500

Program Listing (cont.)

```

1 REM *** REPORT-UNIT1. ***
2 REM C-04
3
4 REM *** M. C. WRIGHT ***
5
6 REM ***** LINE CDEF, ..., LINE CDEF
7 REM INITIALIZE LINE CDEF, ..., LINE CDEF
8 REM REPORT-UNIT1 *****
9
10 THIS LINE Jumps To This LINE EXIT-TH
11 FOR J, NEXT LINE CDEF
12 IF EXIT THEN PRINT "DATA ERROR!" GOTO
13
14 GOTO: REM LOC IN OF MAIN CODE
15
16 THIS LINE Jumps To This LINE EXIT-TH
17 FOR J, NEXT LINE CDEF
18 IF EXIT THEN PRINT "DATA ERROR!" GOTO
19
20 FOR I=0, 1/2500000 LOC IN HIGH
21 FOR J=0, 1/2500000 LOC IN LOW
22 PRINTPRINT "CODE ENTERED: ", I
23 PRINTPRINTPRINT I FOR GOTO-LOC
24
25 DATA 70, 80, 3, 1000, 2, 1000, 107, 0
26 DATA 140, 110, 1000, 30, 2000, 104, 0, 00
27 DATA 1000, 1, 1000, 10000, 1000, 110, 1000
28 DATA 10, 2000, 100, 1000, 1000, 1000, 1000
29 DATA 1000, 1000, 1, 177, 1000, 1000, 1000
30 DATA 100, 1000, 2, 1000, 1000, 1000, 1000

```

[illegible]

Norman Doyle clocks on to Sellco's RC-1000 wrist terminal

THE SELLCO RC-1000, RETAILING AT around \$114, comes complete with application software on dual 5¼ cassettes and a clip-on connector which fits neatly onto two of the pins on the edge of the user port. It measures 41.8 x 10.6 mm, weighs 80 grams and has room for twelve characters on each of the two lines on its LCD display. Internal memory consists of 32 KCH and 16 RAM.

This new device converts the usual wrist-borne technology into a state-of-the-art device which transmits the most concise of the past and hints at what the future has in store for the busy go-getting professional. It is not merely able to clock in the time and date but also has a daily alarm function and can remind you of birthdays, anniversaries and special appointments. It can clock in the current time in named cities, towns or villages worldwide, distributed according to time-zone, act as a railway rail, a daily routine reminder, and store telephone numbers. The applications are limited only by its 32 KCHM memory.

What's all this got to do with Your Commodore? Well, all the information has to be fed into the watch and what better way than the parallel 8-bit bus connector on the back of the Commodore 64?

The 64 software supplied with the database watch is written in BASIC allowing the knowledgeable user to modify the routines. But if anyone comes up with a more user-friendly version, I'll have it now if I make the watch a more attractive proposition - more of the time.

Using the program, data can be entered under one of four categories: weekly alarms, weekly alarms, world time and dates. Time details for the alarm occupy the lower twelve characters line of the 24-character display leaving the upper four for text to remind you of the purpose for the alarm, such as SILENTLY or NOISELESS SLEEPING. They can be set to remind you of appointments either on a daily routine basis or for any special time on a future date.

World times may be selected from any of the 56 cities stored by the program, but new data can be added if the place you require does not appear on the list, either by permanently changing the DATA statements in the program or by a temporary software-controlled addition.

The most flexible function of the watch is the memo-logging. These entries may be further sub-divided into categories which run your personal needs. Each entry can cover the two lines of the display or even overflow onto more lines, if necessary.



WATCH OUT!



This means that telephone numbers can be stored with a name-label to remind you what number it is, or even only notes for an alarm, though only very brief notes could be made to avoid abusing the terminal's capacities by oversteering.

The length of each main data category is selected by the user, so the database could conveniently accommodate schedule alarms. The only limit on its use is that a maximum of 80 entries of 24 characters each can be entered into the memory.

I was latterly disappointed with the quality of the software. Consider for a moment the main market for this kind of equipment, the busy executive. The chance that the programming of the watch would be delegated to a personal assistant or secretary, whose life is probably complicated enough without having to grapple with the complexities of the software provided. User-friendly implies that the user can simply load and

run the program. I tried this with the test package and failed miserably, despite the two help screens and manuals.

I also had to study the manual carefully to understand the program fully. Data entry was laborious and I was disappointed by the length of time it took to save the data to disk. I decided to mark how long it would take to save to tape.

Another drawback of the system is the fact that reprogramming requires hooking up to a computer in the executive will still have to carry a notebook to write down appointments which can later be entered into the watch's memory. A case of hitech for low-tech's sake.

Leno have also produced a wrist watch into which data can be stored simply by writing with your finger on the etched display screen. Now, if someone could find a way to store that data into a computer database that would be a force to be reckoned with.

[illegible]

[illegible]

0000 PRINT#PRINTLN,00,00
 0000 PRINTLN,10,PRINT#PRINTLN SPACE 800 TO PAGE#PRINTLN,PRINTLN
 0000 PRINTLN,1000,PRINTLN,1000
 0100 GOTO0100
 0200 PRINTLN,10,PRINTLN,0
 0300 PRINTLN,10,PRINTLN,10,0 TO CONTINUE ... TO BREAKDOWN
 0400 PRINTLN,10,PRINTLN,10,0
 0500 PRINTLN,10,PRINTLN,10,0
 0600 PRINTLN,10,PRINTLN,10,0
 0700 PRINTLN,10,PRINTLN,10,0
 0800 PRINTLN,10,PRINTLN,10,0
 0900 PRINTLN,10,PRINTLN,10,0
 1000 PRINTLN,10,PRINTLN,10,0
 1100 PRINTLN,10,PRINTLN,10,0
 1200 PRINTLN,10,PRINTLN,10,0
 1300 PRINTLN,10,PRINTLN,10,0
 1400 PRINTLN,10,PRINTLN,10,0
 1500 PRINTLN,10,PRINTLN,10,0
 1600 PRINTLN,10,PRINTLN,10,0
 1700 PRINTLN,10,PRINTLN,10,0
 1800 PRINTLN,10,PRINTLN,10,0
 1900 PRINTLN,10,PRINTLN,10,0
 2000 PRINTLN,10,PRINTLN,10,0
 2100 PRINTLN,10,PRINTLN,10,0
 2200 PRINTLN,10,PRINTLN,10,0
 2300 PRINTLN,10,PRINTLN,10,0
 2400 PRINTLN,10,PRINTLN,10,0
 2500 PRINTLN,10,PRINTLN,10,0
 2600 PRINTLN,10,PRINTLN,10,0
 2700 PRINTLN,10,PRINTLN,10,0
 2800 PRINTLN,10,PRINTLN,10,0
 2900 PRINTLN,10,PRINTLN,10,0
 3000 PRINTLN,10,PRINTLN,10,0
 3100 PRINTLN,10,PRINTLN,10,0
 3200 PRINTLN,10,PRINTLN,10,0
 3300 PRINTLN,10,PRINTLN,10,0
 3400 PRINTLN,10,PRINTLN,10,0
 3500 PRINTLN,10,PRINTLN,10,0
 3600 PRINTLN,10,PRINTLN,10,0
 3700 PRINTLN,10,PRINTLN,10,0
 3800 PRINTLN,10,PRINTLN,10,0
 3900 PRINTLN,10,PRINTLN,10,0
 4000 PRINTLN,10,PRINTLN,10,0
 4100 PRINTLN,10,PRINTLN,10,0
 4200 PRINTLN,10,PRINTLN,10,0
 4300 PRINTLN,10,PRINTLN,10,0
 4400 PRINTLN,10,PRINTLN,10,0
 4500 PRINTLN,10,PRINTLN,10,0
 4600 PRINTLN,10,PRINTLN,10,0
 4700 PRINTLN,10,PRINTLN,10,0
 4800 PRINTLN,10,PRINTLN,10,0
 4900 PRINTLN,10,PRINTLN,10,0
 5000 PRINTLN,10,PRINTLN,10,0
 5100 PRINTLN,10,PRINTLN,10,0
 5200 PRINTLN,10,PRINTLN,10,0
 5300 PRINTLN,10,PRINTLN,10,0
 5400 PRINTLN,10,PRINTLN,10,0
 5500 PRINTLN,10,PRINTLN,10,0
 5600 PRINTLN,10,PRINTLN,10,0
 5700 PRINTLN,10,PRINTLN,10,0
 5800 PRINTLN,10,PRINTLN,10,0
 5900 PRINTLN,10,PRINTLN,10,0
 6000 PRINTLN,10,PRINTLN,10,0
 6100 PRINTLN,10,PRINTLN,10,0
 6200 PRINTLN,10,PRINTLN,10,0
 6300 PRINTLN,10,PRINTLN,10,0
 6400 PRINTLN,10,PRINTLN,10,0
 6500 PRINTLN,10,PRINTLN,10,0
 6600 PRINTLN,10,PRINTLN,10,0
 6700 PRINTLN,10,PRINTLN,10,0
 6800 PRINTLN,10,PRINTLN,10,0
 6900 PRINTLN,10,PRINTLN,10,0
 7000 PRINTLN,10,PRINTLN,10,0
 7100 PRINTLN,10,PRINTLN,10,0
 7200 PRINTLN,10,PRINTLN,10,0
 7300 PRINTLN,10,PRINTLN,10,0
 7400 PRINTLN,10,PRINTLN,10,0
 7500 PRINTLN,10,PRINTLN,10,0
 7600 PRINTLN,10,PRINTLN,10,0
 7700 PRINTLN,10,PRINTLN,10,0
 7800 PRINTLN,10,PRINTLN,10,0
 7900 PRINTLN,10,PRINTLN,10,0
 8000 PRINTLN,10,PRINTLN,10,0
 8100 PRINTLN,10,PRINTLN,10,0
 8200 PRINTLN,10,PRINTLN,10,0
 8300 PRINTLN,10,PRINTLN,10,0
 8400 PRINTLN,10,PRINTLN,10,0
 8500 PRINTLN,10,PRINTLN,10,0
 8600 PRINTLN,10,PRINTLN,10,0
 8700 PRINTLN,10,PRINTLN,10,0
 8800 PRINTLN,10,PRINTLN,10,0
 8900 PRINTLN,10,PRINTLN,10,0
 9000 PRINTLN,10,PRINTLN,10,0
 9100 PRINTLN,10,PRINTLN,10,0
 9200 PRINTLN,10,PRINTLN,10,0
 9300 PRINTLN,10,PRINTLN,10,0
 9400 PRINTLN,10,PRINTLN,10,0
 9500 PRINTLN,10,PRINTLN,10,0
 9600 PRINTLN,10,PRINTLN,10,0
 9700 PRINTLN,10,PRINTLN,10,0
 9800 PRINTLN,10,PRINTLN,10,0
 9900 PRINTLN,10,PRINTLN,10,0
 1000 PRINTLN,10,PRINTLN,10,0

[illegible]

TOP 20

Compiled by

Game Software

COMMODORE 64

TITLE

- 1 Self Aid
- 2 International Basket Ball
- 3 Dambusters
- 4 Flitcap II
- 5 Castles
- 6 World Series Baseball
- 7 Entombed
- 8 Impossible Mission
- 9 Theatre Europe
- 10 Aircraft
- 11 Evermore's a Wally
- 12 Shadowline
- 13 Poly Position
- 14 Moon Cresta
- 15 Bruce Lee
- 16 Big Mac
- 17 Kikstart
- 18 Rocket Ball
- 19 Sprinter 40
- 20 Bald Over Moscow

PUBLISHER

- Various
Commodore
US Gold
CIS
Palace Software
Imagine
Ultimate
CIS
PSS
Bliz
Mikrogen
Beyond
Acari
Inventive
US Gold

Mastertronic
IKK
Microsonit
US Gold

Retail sales for the week ending May 27th 1985



VIC 20

Top Ten

TITLE

- 1 BP The Game
- 2 Hunchback
- 3 Berksman
- 4 Mickey the Bricky
- 5 Doodledog
- 6 Psycho Shopper
- 7 Catcha Snatcha
- 8 Football Manager
- 9 Vegas Jackpot
- 10 Bewitched

PUBLISHER

- Mastertronic
Orean
Mastertronic
Flukind
Mastertronic
Mastertronic
Imagine
Addictive Games
Mastertronic
Imagine

Retail sales for the month ended May 31th 1985

Compiled by Gallup for the industry's weekly trade magazine, Computer and Software Retailing. For details contact John Ross, Computer and Software Retailing, 227 Regent Street, London, W1R 9AB 01 434 2121



MiniCable 3 Keyboard Mixer extends the possibility still further, by letting you set up, at least from a library of eighty, keyboard scales, to select non-European scales and intonations. The choice is very varied, from Japanese, Indonesian, Balinese, Persian and Indian.

MusicalCalc's range of creative possibilities is further extended by the use of musical "templates", located over the program to replace the 12 sounds and notes with 12 different ones. The African/Jazz template is certainly very impressive, as is the Rock/Jazz Wave template.

The MusiCalc system is the cheapest based on the market, and as a MusiCalc representative said to me, "at the price, it should be!" What is the price? A cool \$45 for MusiCalc 1, \$38 each for 2 and 3, and \$35 for each of the music temp used. But even THAT doesn't put me off! It's worth every penny; so if you're should be worried at all.

I thought AIDS was a kind of skirt.

The fact that the instrument is used extensively (and appropriately) at Mesa College system can utilize MIDI to help one to the next student, and one very much the age of the moment, MIDI, or digital instrument. Digital interface, allows any youth with MIDI to be linked and used with any, otherwise, as with clamping the system. The concept of this is that you can for instance, use a MIDI guitar system to direct a drum set, or a keyboard to drive a guitar set. Combos.

If you want to know all about AED and a good deal more besides, then I must refer you to Alan Turing's excellent book, "The computer: Music on the Commodore 64" published by S. Myers Books. In it he covers all aspects of computer music, with special reference to the 64. He is, however, a bit out of all other references AED makes.

Soaking in the machines

Make sure you don't find things to learn, and it can be invaluable to the many programmers. Especially if you want to write music for a computer game. One thing you learn about when you learn machine code is the significance of 16 bit numbers.

4. Compostrol 44 can only deal with 8 bits at a time. Due to those bits being arbitrary the highest 8 bit number you can get is 255. So when you have to input a number like 440, the frequency of the note A, above middle C, you're up the creek. So you have to split the number you want 440 into, the most convenient is

hertz, and the least significant, or byte. But, my dear friend who resembles all those annoying numbers for each value, high frequency and low frequency. You remember Freud? (You don't blame it on you? Buy a book now, unreadable!) Well, that's what it was done.

Another thing you'll learn by checking out memory maps at the MDK when there's a ready-made one in Jay's *Knights' Room* (new-line) later in the purposes to which you can put Oscillator 1. At address 34299 (312) you can read the output of Osc 1. You can use this information to "modulate" either of the other waves. The digital (numbers) output from the Oscillator could be made to make the rest wobble or roll, using the figures output from the source to increase the pitch or flow (Think of it as a bit of homework, *James Armit*) (PENDING address 34299 has 128 bits, the output of Osc 1 is 16) (you can hear the effect. Try it.)

Age Group	Male (%)	Female (%)
18-24	~15	~10
25-34	~25	~15
35-44	~10	~25
45-54	~5	~20
55-64	~5	~15
65-74	~5	~10
75-84	~5	~5
85+	~5	~5

One of the most recent things you've bought? 84 owner-discovery secret or how a how many the del is to move with the outside world via the video/audio secret on the back of your, you can look it to your best-for example, it's doing the job. That is the best center a girl of the four holes as your 3-pan. 84 secret. In this manner, you could record the musical output from your computer, CD you could put it through a musical effects pedal like a chorus or flanger. This will give the sound more body, and generating faster it up for secret log. It's another way to know and.

The well-tempered bookshelf

The daily way to get involved goes as far as to do up all the things I've mentioned so far to get a good book on the one you're most interested in. Due to considerations of space I haven't been able to go into the topic in any great depth, but there are books, articles and websites that do. So, now I present the Hippo Good Home Book Guide.

lan Waugh "Commodore 64 Music: Jamming Books: — This is a book about the 64's musical capacity in great depth and readability. Mr. Waugh treats the subject with clarity and covers all aspects of making music with your computer. The variety scope of the 64's chip are particularly useful to the aspiring programmer, as are the exhaustive explanations as to what does what. A

essential read for those wishing to learn how to use the left mouse button.

Mark Jesinski of Thomson's Music Center/Commodore Inc. (Sundance Square) - When Ian Hough leaves off, Mark Jesinski takes up, and covers the multi-ground thesaurus: Understanding, and details of ArtD only is here, as well as comprehensive lists of all the best music software and hardware available, along with manufacturers' addresses and phone numbers. His program already has a lot of technical data, and he plans to add all the reader-in very clear language, highlighting many drawbacks, here and there, but one can only ever realize, gain with experience. A very informative and stimulating book, and well worth the cost. (C)

George Martin's "Making Music" (Pan Books) — The producer of the Beatles is joined by everyone who's ever done anything in music on their special topic: Bernard Cribbins on electronic music; Hans Zimmer on synthesizers; Herbie Hancock on playing synthesizers; and Warren Zevon on computer music, plus many, many more. As far as I'm concerned, this is the best text in (or is recording and the technical aspects of music) are concerned. It's also a *Singer* award winner.

Cathy Davis, "Machine Language for the Absolute Beginner" (John Warner House) — Inquisitor writers and I, generating I found, as a person with an ongoing use knowledge of machine code, I have one what I need to, to solve a particular problem that is failed in the necessary gap in my knowledge, and now provides a new source of reference, for those times when my own shows, the better out with the both with

Editor: English: "The Albanian Language Book of the Comprehensive Set (Albanian/Arbërisht)" — translated from German, I think, because the English is a little stiff, but overall a book packed with content. OK, so the cover and sequencing wouldn't be any pro's, but then we aren't here to judge design. Not so good as a reference book, guidelines for the various on-line courses.

100

So, that, my fine lady and ladies, is all you need to know to make music with your computer. Simple! Isn't it? I hope you've enjoyed this series. If you have any queries about the songs (that rhythm), then please do not hesitate to write to me, Phil South, c/o Your Commodore Angus Appreciation Press, Box 1 Golden Square, U76A7676A, 08 98 76 76 76.



EVERYBODY WITH SLIGHTS INVOLVED with Commodore computers knows about the famous (or infamous) Commodore test room.

Later, PPH came with an external tape deck, because the space (and front panel) was needed to fit in a floppyboard. Some grumbles were heard from the computer fraternity at this stage, but nobody raised any serious objections due to maintaining compatibility with earlier models.

The big problem is growth, whereas most people have a cassette recorder nowadays, most don't have the 140 necessary to buy a C-200 or 2144.

Looking at the output of the tape generator it doesn't seem too difficult to plug in a normal cassette as long as you connect it correctly. Also, this is not so. Speech, music, and normal computer tape machines have their sound waves composed of all the waves or the like—great for music and speech, but not so good for transmitting computer information, which is, after all, a series of ones and zeros and not analogue at all.

The CompuShare Page interface uses a series of square waves to transmit information (much more sensitive for CompuShare data). This results in a series

BEAR FACED



wave. Domestic cassette versions have spent weeks, some even have managed to turn their sales into waves, not what we want at all.

This brings us to the problem aspect of a cheap system for Commodore users. What we want is a cheap black box that plugs into the Mac-VC, and lets you use a domestic cassette recorder.

The "Turbo" cassette interface claims to solve the problem. Pack in antistatic bubble packaging, it is neither cheap or black, but the "Turbo" does say that it will load all tapes (including turbo). Turbo is another problem for Commodore users in some normal Commodore tape decks will not even accept them, the two cassettes are not too hot.

This Raman-scattering technique is complementary to a special optical method as described by other authors [10] and increases reliability. There are also two light sources which indicate whether a 1:1[40] or a 1:2[40] is in operation. On opposite sides of the main lens in the relay construction used here there

ments that go to your standard tape deck. Unfortunately, it cannot give a favorable report for this one as it does not function as it claimed. It will load nominal 44 tapes, and it is slightly more reliable with tapes that have been written by it than with tapes written by a normal Commodore tape system. With Turbos though it was another story altogether. I tried on different tape decks, two interfaces and two Commodore tops as well as one CIBA 2010. The only turbo that would load is Intertek, which was never for the reliability of the Turbo than for the interface because Intertek is notoriously unreliable, and will load into almost anything.

My verdict is that at £19.95 this device is far too expensive a gamble to take. You have to gamble that your team desk will work with it, your computer will work with it, and that every piece of software that you may buy with it will work - which is very unlikely, and numerous most shops will refuse to swap software if it won't work on their system. Surely it's too dangerous isn't too much for price of my call?



Hampton Court was never as dangerous as this program from Paul Randall for the unexpanded VIC 20.

DEATH MAZE



DRIFT YOUR CRAFT AROUND A computer-generated maze while collecting as many of the flags as possible. Be extremely careful, however, as the slightest knock will reduce you of one of your five lives.

Your craft can be controlled by either joystick or keyboard. It rotates you right, I rotates left and the space bar starts your craft.

Entering the Program

Death Maze must be typed into your VIC 20 in three parts; this is due to the large amount of machine code and character sets.

Four simple steps must be followed in entering the program (these are as follows):

1. Enter Program 1 and save on tape.
2. Enter the machine code loader and save on a separate tape.
3. Using the loader program type in the two values exactly as printed. Each line

starts with a two digit number and ends with a check sum. Lines can be input in any order. If an error is made, the line will be displayed and can then be corrected using the cursor and the-DELETE keys.

Data can be saved to tape at any time by entering the word SAVE on the NEXT LINE prompt.

If you are only saving part of the data it is probably better to save it onto a separate tape. Remember that CMD is save into the machine by typing LOAD when presented with the NEXT LINE prompt.

If you save data that if you have made any corrections to the data that line 00 will have been corrupted it is therefore advisable that you type this line in last.

When all of the data has been typed in SAVE it onto the tape straight after Program one using the SAVE option as before.

4. Enter the main program and save into the machine code and program one.

Program descriptions

Program two: 5-58	Protects memory and loads in data.
35-100 1500-1550	Instructions Machine code for joystick movement.
1600	Loads in main program.
Program two: Machine code Hex values	
Program three: 4-40	Set up variables (M is the number of craft).
15-45	Set up screen.
120-180	Main movement routines.
200-270	Craft routine.
280-340	Game over routine.
350-360	Finalised level.
400-474	Title screen.
500-590	Set screen.

Program Listing 1

```

5 POKE52,22:POKE56,22
10 POKE788,2:POKE791,1:POKE792,1:SYS65466
15 POKE798,8:SYS65469
18 PRINT"O      LOADING
20 POKE798,8:POKE791,18:POKE792,22:SYS65493
30 POKE36879,234:POKE36879,255
35 PRINT"OAS      DEATH RAZE      "
37 PRINT"O SPORT OF THE FUTURE!"
39 PRINT"O      GUIDE YOUR CRAFT "
41 PRINT"O      AROUND EACH SECTOR"
43 PRINT"O      COLLECTING FLAGS"
45 PRINT"OAND AVOIDING BARRIERS."
47 PRINT"PRESS FIRE OR SPACE TO      START. "
50 FORJ=1TO9
52 PRINT"XXXXXXXXXXXXXXXXXXXX"TAB(J+5)"*";
54 FORK=1TO100:HEXTK
55 ONJGOSUB399,391,392,393,394,395,396,397,398
56 POKE36879,J+5:POKE36879,255-J*10
57 NEXTJ:POKE36879,0
59 GETA:IFAB=""THEN65
60 PRINT"OAS      DEATH RAZE      "
62 PRINT"O      THE CRAFT THRUSTS "
64 PRINT"O      FORWARD."
66 PRINT"O ROTATE RIGHT-HIT K"
68 PRINT"O ROTATE LEFT-HIT J"
70 PRINT"O OR USE A JOYSTICK"
72 FORJ=1TO9
74 PRINT"XXXXXXXXXXXXXXXXXXXX"TAB(J+5)"*";
76 FORK=1TO100:HEXTK
77 ONJGOSUB399,391,392,393,394,395,396,397,398
78 POKE36879,J+5:POKE36879,255-J*10
79 NEXTJ:POKE36879,0
81 GETA:IFAB=""THEN110
82 POKE36879,0
83 GOTO1399
84 PRINT"OH":RETURN
85 PRINT"OI":RETURN
86 PRINT"OT":RETURN
87 PRINT"OB":RETURN
88 PRINT"OM":RETURN
89 PRINT"O":RETURN
90 PRINT"O":RETURN
91 PRINT"OK":RETURN
92 PRINT"OE":RETURN
93 PRINT"O":RETURN
1000 DATA120,169,0,141,20,3,169,888,141,21,3,89,95,169,0,141
1010 DATA19,145,141,34,145,173,17,145,41,31,74,74,133,144,173,17
1020 DATA145,41,32,74,5,144,139,144,173,32,145,41,128,74,74,74
1030 DATA74,5,144,73,31,139,144,169,255,141,34,145,76,191,234,234
1040 T=0:S=673
1050 FORI=9TO63
1060 READA:IFAB=""***THENPOKE5+I,(S+13)/256:POKE5+I-5,(S+13)AND255:NEXT
1070 POKE1+9,VAL(A):T=T+VAL(A):NEXT
1080 POKE198,0:PRINT"O":POKE198,2:POKE631,19:POKE632,13J

```


MACHINE CODE DATA

```

00C4F0605500582F01E0501F0110520A0FFB102F02B0A00C0F100020603010200# 394
01C0FF00002C003040A000910006000A0500C0000000200100C0D000F040100001# 346
02A001C09030010009005091A000070000100000091000000100040200000000002021E00# 335
03010500D0A0091000F0000C0910A00CD00E001FF00000000F230402070172000# 373
0414A000000000000100000100010A0100010C01000101010010010100001010000# 205
05000101000401010000201000002010100010101000401010000201000000010100# 45
06010100000201010004010100010100000101010004010100000101000001010100# 47
0700010100010104000401010000201010002010500000101000001020000010100# 57
080101000002011100020101000201010011010200020114000001010007010100# 40
090701010001010100000107000101070001010100010101000001010000010200# 52
10020101000101010001010100001000001010100010101000001000000010100# 50
110101010001010100020101000001010000010300040101000101010001010100# 34
12000101000001010005010000010103000201050000010500040101001012000# 74
131000500110120010012001070120011F16200D1F0120051F0220011F042001# 200
141F0220021F0220011F0120011F0420011F0220051F0620011F0120061F022001# 183
151F0420011F0120061F0120011F0420011F0220051F0120011F0620011F012004# 185
161F0220031F0120021F0120061F0620011F0620021F0620011F0120061F022011# 192
171F0220011F0220011F1120021F0220041F0020011F0720011F0720011F012001# 189
181F0320071F0120071F0120011F0120011F0320011F0520031F0520011F012001# 186
191F0120011F0320011F0620031F0120011F0120011F0220091F0620011F012001# 188
201F0120011F0220011F0320011F0320031F0420011F0120011F0120011F022001# 171
211F0220011F0520041F0120031F0220051F0720051F0420011F19204201000001# 194
220001000100010C010301010010010700010100000201140002010500000100# 129
230000010C06110105000201050000010C000201030000010C0002010300000103# 134
240001010000000103000101100002010300010110000201030001011000020114# 101
250002011400020100100120101000201140002010000010100000F010700020100# 132
2600010100017012004100070011001200130012005700120011F1620091F0120# 199

```


Procedures: Lesson 3, Round 1

[illegible]

Program Listing 2 (cont.)

```

53881C2828000000FFFFFFFFFFFFFFFF0000000000000001183EECEC3E188118# 426
54193C667E3C64C388087C37377CDB88C3663C7E663C18188C1C3C108C8484848# 483
5743483C48443888488188888888888848818181888848828188888818288888# 148
58281C3E1C2808000000003E08888888888888888888888888888888888888# 162
59888888881818888888888182848888C424E3882423C88881828888888888888# 197
6842888C38487E888C42821C82423C88848C14247E8484887E487884824438881C# 241
6128487C42423C887E428488181818888C42423C42423C888C42423E8284388888# 224
6288888888888888888888888888888888888888888888888888888888888888# 148
631888888C1853884143438847414D45# 126

```

Program Listing 3

```

4 N=36876
5 POKES2,22:POKE55,22:POKE81,17:POKE55,17
10 SYS573 POKEN+2,15:POKE36869,255 POKEN+3,158
30 DIMA(3),B(3),C(4),A(8)=33 A(1)=34-A(2)=35-A(3)=36 C(1)=5658:
C(2)=5732:C(3)=5758
40 C(4)=5756:B(8)=1:B(1)=22:B(2)=1:B(3)=22:D=7955 N=5:L=1:GOSUB488
53 GOSUB588 GOSUB588
60 PRINT"###SCORE":G:PRINTTAB(14)"LIVES",N
65 PRINT"###LEVEL",L:PRINTTAB(14)"FLIPS":F
120 C=PEEK(197)
125 IF1=8ANDST=168C=32THENJ=1
135 IFST=48C=28THENH=H+1:IFE=-1THENH=3
140 IFST=88C=44THENH=H+1:IFE=4THENH=8
150 POKED,32:POKE38728+D,8:IFI=8THEN178
160 B=D+B(E)
162 IFPEEK(D)=31THENH=H-1:D=7955:J=8 GOSUB288:IFH=8THEN80TO338
164 IFPEEK(D)=37THENH=H+F*F:GOSUB228:F=F+1:IFF=9THENL=L+1:GOTO388
178 POKED,8C:POKE38728+D,1
175 FORJ=1TOH:NEXT
188 DOTO88
288 FORJ=1TO18
282 POKEN+1,255-J*18
284 POKEN-12,11:POKEN-11,35:GOSUB588
288 POKEN-12,13:POKEN-11,41
218 NEXTJ POKEN+1,8:POKEN-12,12:POKEN-11,38:RETURN
220 POKEN,255:FORJ=1TO18:NEXT:POKEN,8:RETURN
238 FORJ=1TO4:PRINT"#####
232 PRINTTAB(6)"GAME OVER
234 POKEN,255:GOSUB588
236 PRINT"#####
238 PRINTTAB(6)"GAME OVER":POKEN,128
241 GOSUB588:NEXT:POKEN,8

```


Program Listing 3 (cont.)

```

244 POKE190,B:PRINTTR(65)"HIT A KEY"
245 GET#1:IF#1=""THEN246
246 CLR:RUN
247 FORJ=1TO10
248 POKEH,129+J*10
249 FORJ1=1TO10:NEXTJ1
250 NEXTJ
251 FORJ=10TO1STEP-1
252 POKEH,255-J*10
253 FORJ1=1TO10:NEXTJ1
254 NEXTJ:POKEH,0
255 PRINTCHR$(19)
256 I=0:F=0:D=7925:G=0+L*100:IFL=5THENL=1:H=H-50:G=0+1000
257 GOTO255
258 PRINT"SKILL LEVEL"
259 PRINT"00010-EXPERT"
260 PRINT"00040-AVERAGE"
261 PRINT"00080-ADVISED"
262 GET#1:IF#1<"1"OR#1>"3"THEN#1=2
263 H=VAL(CHR$(#1)):RETURN
264 FORD=1TO100:NEXTD:RETURN
265 SYS$(CL):POKE185,31:POKE30905,D:RETURN
266 FORJ=1TO9:READ:POKEK,37:POKE30720+K,2:NEXT:RESTORE:RETURN
267 DATA7770,7780,7790,7800,7810,7820,7830,7840,7850,7860,7870,7880,7890,7900,7910,7920,7930,7940,7950,7960,7970,7980,7990,8000,8010,8020,8030,8040,8050,8060,8070,8080,8090,8100,8110,8120,8130,8140,8150,8160,8170,8180,8190,8200,8210,8220,8230,8240,8250,8260,8270,8280,8290,8300,8310,8320,8330,8340,8350,8360,8370,8380,8390,8400,8410,8420,8430,8440,8450,8460,8470,8480,8490,8500,8510,8520,8530,8540,8550,8560,8570,8580,8590,8600,8610,8620,8630,8640,8650,8660,8670,8680,8690,8700,8710,8720,8730,8740,8750,8760,8770,8780,8790,8800,8810,8820,8830,8840,8850,8860,8870,8880,8890,8900,8910,8920,8930,8940,8950,8960,8970,8980,8990,9000,9010,9020,9030,9040,9050,9060,9070,9080,9090,9100,9110,9120,9130,9140,9150,9160,9170,9180,9190,9200,9210,9220,9230,9240,9250,9260,9270,9280,9290,9300,9310,9320,9330,9340,9350,9360,9370,9380,9390,9400,9410,9420,9430,9440,9450,9460,9470,9480,9490,9500,9510,9520,9530,9540,9550,9560,9570,9580,9590,9600,9610,9620,9630,9640,9650,9660,9670,9680,9690,9700,9710,9720,9730,9740,9750,9760,9770,9780,9790,9800,9810,9820,9830,9840,9850,9860,9870,9880,9890,9900,9910,9920,9930,9940,9950,9960,9970,9980,9990,10000

```

Machine Code Loader

```

5 H1=22:L0=17
10 P=H1*256+L0
20 PRINT"NEXT LINE":INPUT#1
30 IF#1="SAVE"THEN300
40 IF#1="LOAD"THEN320
50 IF#1="END"THENEND
60 T=VAL(LEFT$(#1,2)):C=0:D=0:J=0
70 H=ASC(CHR$(#1,1)):H=ASC(CHR$(#1,1)):J=J+1
80 IFH=42THEN100
90 IFH=43THEN110
100 SUB150:D=H*15:P=H*65536:D=D+H
110 POKEP+T*256+D,D:H=H+1:IFC=32THEN60
120 IFC=VAL(LEFT$(#1,2)):THEN20
130 PRINT"ERROR. RE-INPUT":PRINT#1:INPUT#1:GOTO30
140 H=H-48:IFH=8THENH=7
150 C=C+H:RETURN
200 SUB200:GOTO220
210 PRINT"POSITION TYPE THEN":PRINT"PRESS A KEY"
220 GET#1:IF#1=""THEN267
230 POKE700,1:POKE701,1:POKE702,1:SYS63466
240 POKE700,2:POKE701,20:POKE702,1:POKE276,60:POKE277,77:SYS63463:RETURN
250 POKE700,0:SYS63463:GOTO20
260 SUB200:POKE251,L0:POKE252,H1:POKE700,251:POKE701,0:POKE702,20
:SYS63466:GOTO 020


```



```

1 REM DEMO 1  FLASH ROUTINE
2 REM
10 PRINTCHR$(147);CHR$(13)
20 HC=1000:DE=25:FL=0:GOSUB130
30 PRINT"WASN'T THAT APPALLING?"
40 PRINT:PRINT"WELL THINGS CAN BE WASTIER...HOW ABOUT THIS...."
50 DE=1:HC=1000:GOSUB130
60 PRINT:PRINT"OK, IF THAT MAKES YOUR SYMPADS TWITCH THIS IS A LITTLE GENTLER"
70 HC=1000:DE=225:GOSUB130
80 PRINT:PRINT"YOU CAN TALK JUST THE BORDER...."
90 FL=1:HC=200:FOR DE=1000:STEP5:GOSUB130:NEXT
100 PRINT:PRINT"OR JUST THE SCREEN...."
110 FL=2:HC=200:FOR DE=1000:STEP5:GOSUB130:NEXT
120 END
130 POKESB,INT(HC/256):POKEB,HC-PEEK(256*4256+POKESB,FL
140 POKESB,DE:SYS2000
150 REM DE=DELAY 1...RDY, 255 HXK
160 REM HC=NO OF LOOPS
170 REM FL=FLAG, FL=1...BORDER FL=2...SCREEN FL=3...30TH
180 RETURN

```



```

1 REM
2 REM LONGER 2
3 REM
4 REM SLOW FILL
5 REM
10 DATA 9,130,200,173,63,9,130,200,253,96,169,8,133,251,169,4,133,252,169
20 DATA 8,133,253,169,216,133,254,169,8,173,46,3,145,251,173,65,3,145,253,165
30 DATA 251,24,185,1,133,251,165,252,185,8,133,252,165,253,24,185,1,133,253
40 DATA 254,185,8,133,254,32,133,255,165,251,251,252,255,259,165,252,261
50 DATA 7,255,253,96,8
60 REM
70 FOR I=51200:TO54000
80 SCREEN: T=T+1
90 POKELX
100 NEXT
110 IF T<11500 THENPRINT"DATA ERROR"

```



```

1 REM LOADER 3
2 REM
3 REM RANDOM FILL
4 REM
10 DATA169.8,141.182.3,141.133.3,32.55,262.92,91.282,173,132.3,185.1,141.132
20 DATA3.173,133.3,185.8,141.133.3,285.152.3,269,233,96,24,168,41,162.8,132
30 DATA98,142.3,125,142.3,157,142.3,282,18,343,96,189.8,182.8,157,142.3,282
40 DATA6.258,95,173,142.3,133,251,133,253,173,143.3,41.3,9.4,133,252,24,185
50 DATA12,133,254,32,96,282,96,32,64,282,168.8,173,134,3,145,251,173,133
60 DATA3,248.5,173,134.3,76,117,282,173,144.3,41.35,145,253,96.8
70 REM
80 FOR I=517127035832
90 READ X: T=X
100 POKEI,X
110 NEXT
120 IF T<13180 THEN PRINT"DATA ERROR"

```

```

1 REM DEMO 2: RANDOM FLASH
2 REM
10 POKE328,44:POKE862,53:POKE921,8:POKE922,1:SV551712
20 REM 921....CHRR
30 REM 928....NO LOOPS...44 FILLS SCREEN COMPLETELY
40 REM 921....FLAG 8=MULTI COLOUR
50 REM .....1=MONOCHROME
60 REM 922....COLOUR

```

```

1 REM LOADER 4
2 REM
3 REM TWO PIXEL FILL
4 REM
10 DATA169.8,141.182.3,189.4,141.133.3,32,157,281,173,138.3,141,136.3,175
20 DATA932.3,132,253,133,253,173,133.3,138,252,24,185,212,133,254,32,99,281
30 DATA288,136.3,173,136.3,285,148.3,248,28,24,173,132.3,185,48,141,132.3
40 DATA173,133.3,185.8,141,133.3,76,19,281,96,168.8,173,137.3,145,251,173
50 DATA138.3,145,253,288,192,48,288,241,32,114,281,96,162.8,189,189,281,141
60 DATA137.3,32,71,281,232,224.5,288,242,96,119,128,226,239,168,72,138,72
70 DATA182,72,173,141.3,174,142.3,282,289,273,136,286,247,184,168,184,173
80 DATA184,95,173,139.3,192,1,248,21,186,173,132.3,24,285,48,141,132.3,173
90 DATA133.3,185.8,141,133.3,136,286,236,96.8
100 REM
110 FOR I=81495 TO 81692
120 READ X: T=X
130 POKE I,X
140 NEXT
150 IF T<28880 THEN PRINT"DATA ERROR"

```

```

1 REM DEMO 3: TWO PIXEL FILL
2 REM
10 POKE396,3: REM COLOUR
20 POKE 987,3: REM START POSITION
30 POKE 988,24: REM END POSITION+1
40 POKE 989,48: REM OUTER DELAY LOOP
50 POKE992,48: REM INNER DELAY LOOP
60 SV551456

```


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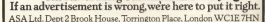
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